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THE MARINE REVIEW

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No. 1

Ship Building on the Lakes.

The shipyards of the great lakes have seventy-one vessels under construction for 1907 delivery, of which forty-five are bulk freighters, four are passenger steamers, four are package freighters, five are tugs, two dredges, two car ferries, five scows, three hopper barges, and one quarantine steamer. Of these forty-five bulk freighters, to which the greatest interest attaches because the ore trade is the dominant trade of the lakes, thirty are building at the yards of the American Ship Building Co., nine by the Great Lakes Engineering Works, three by the Toledo Ship Building Co., two by the Collingwood Ship Building Co., and one by the Canadian Ship Building Co. These forty-five bulk freighters have a carrying capacity of 302,000 gross tons on a single trip, or 6,040,000 tons in an average season of twenty trips. In addition there is to be added to this 1907 program, three vessels which were taken for 1907 delivery by the American Ship Building Co., but which were actually delivered in the fall of 1906, the W. E. Fitzgerald and James S. Dunham for Capt. Dennis Sullivan of Chicago, and the Dan R. Hanna for the Pioneer Steamship Co., of Cleveland. The Dunham and Fitzgerald have carrying capacities of 6,500 tons each and the Hanna 10,000 tons. These three steamers increase the available tonnage for a season by 460,000 tons, making the total increase available for next year's ore trade 6,500,000 tons. Of course, not all of this tonnage will enjoy a full season, but this deficiency is offset by the steamers for 1906 delivery which did not go into commission until late in the fall of 1906, but which will of course be ready for service at the opening of navigation.

Of the steamers for 1907 delivery, the American Ship Building Co. in addition to the Fitzgerald, Dunham and Hanna actually delivered, has already launched the steamers James F. Morrow, building for Joseph Sellwood of Duluth; the Sheldon Parks, build-

ing for W. A. & A. H. Hawgood of Cleveland; the W. B. Kerr, building for the Weston Transit Co. of Tonawanda, and the Gen. Garretson, building for the Gilchrist Transportation Co. of Cleveland. The Great Lakes Engineering Works has launched the John Mitchell, building for the Cornell Steamship Co., of Chicago.

This enormous shipbuilding program exceeds in number, though it does not exceed in actual carrying capacity, the fine list of orders that the shipbuilders of the lakes had on hand when the year 1906 opened. In January last the shipbuilders had under order thirty-nine vessels, of which thirty-four were bulk freighters, two package freighters, two car ferries, and one passenger steamer. With the exception of two 6,500-ton freighters, these vessels had carrying capacities ranging from 8,000 to 12,000 tons, the thirty-four having a carrying capacity on a single trip of 338,000 tons, moving approximately 6,760,000 tons in a single season. The average carrying capacity of the 1907 shipbuilding program is reduced by the fact that there are fifteen steamers building having carrying capacities between 6,500 and 7,000 tons. This indicates a tendency to return to a medium sized carrier. Quite a number of these orders for 1907 delivery were placed in the spring of 1906, showing the confidence which vessel owners have in the continued prosperity of lake trade. The new element introduced in the shipowning field from among the steel-making companies is that of the Lackawanna Steamship Co. of Buffalo, the lake end of the Lackawanna Steel Co. This company placed orders for eight ships, six of 7,000 tons and two of 8,000 tons capacity.

The Pittsburg Steamship Co., which is the lake end of the United States Steel Corporation, continued its policy of ordering the largest sized carriers and placed orders for four 600-footers. When these are delivered the Steel Corporation will have twelve of the

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largest sized carriers on the lakes, eight 600-footers and four 569-footers. The Tonawanda Iron & Steel Co. will have the distinction, however, of operating the largest carriers on the lakes, as the three steamers building for the Weston Transit Co. are to be 605 ft. long. The United States Steel Corporation, the Jones & Laughlin Steel Co., the Cambria Steel Co., the Lackawanna Steel Co. and the Tonawanda Iron & Steel Co. are the steel-making companies that now have ships on the lakes, showing the desire of owners and consumers of iron ore to control their own avenues of transportation.

The Toledo Ship Building Co., which purchased the Craig shipyard a year ago, has spent a year in developing the yard into one of the best on the lakes. Great thought has been expended upon the plan of the yard and money has not been spared in carrying out the arrangement of the designers. The new dry dock will be completed within six weeks, giving the company two dry docks capable of docking the longest and

widest carriers on the lakes. Its shops are equipped with the latest and best machinery, and the facilities which this yard enjoys for quick repair work are unusual. During the year it built one steamer for its own account, but sold it before launching to G. A. Tomlinson of Duluth. This steamer is the Sierra of 7,000 tons capacity. It has at present three steamers under order for Smith & Wilkinson of Syracuse, N. Y.

The Great Lakes Engineering Works, too, has taken contract to supply the tubes for the new Michigan Central tunnel under the Detroit river, which is practically shipyard work, and will keep its St. Clair yard busy well into 1908.

In point of fact, lake shipbuilders have never had on hand the amount of work with which they are blessed today. All of the yards on the lakes from Buffalo to Duluth are great hives of industry, giving employment to thousands upon thousands of men. The leading particulars of all this new construction will be found in the shipbuilding tables, and there will be found elsewhere in this issue tables showing the vessels launched on the great lakes for several years past.

VESSELS UNDER CONSTRUCTION IN GREAT LAKES SHIP YARDS FOR 1907 DELIVERY.

AMERICAN SHIP BUILDING CO.'S YARDS.													
To be built at	Type or Name	Dimensions in ft.				No. of Hatches	No. of Hatches	Dimensions of Engines	Boilers, dimensions in feet and inches	Draft	Steam Pressure, Pounds	Capacity, Gross Tons	For whom building
		Over all	Keel	Beam	Depth								
Lorain	L. S. DeGraef	605	585	60	32	36	12	22 1/2, 37 1/2, 65-42	15.4 1/2 x 11.6	Ellis & Eaves	200	12,000	Weston Transit Co., North Tonawanda, N. Y.
Lorain	W. M. Mills	605	585	60	32	36	12	22 1/2, 37 1/2, 65-42	15.4 1/2 x 11.6	Ellis & Eaves	200	12,000	Weston Transit Co., North Tonawanda, N. Y.
Chicago	Wm. B. Kerr	605	585	60	32	36	12	22 1/2, 37 1/2, 65-42	15.4 1/2 x 11.6	Ellis & Eaves	200	12,000	Weston Transit Co., North Tonawanda, N. Y.
Lorain	Hugh Kennedy	552	532	56	31	32	12	23 1/2, 38, 63-42	15 x 11.6	Ellis & Eaves	180	10,000	John Mitchell, Cleveland.
Cleveland	Freighter, Jas. F. Morrow	552	532	56	31	32	12	23 1/2, 38, 63-42	14.6 x 11.6	Ellis & Eaves	180	10,000	Henry Steinbrenner, Cleveland.
Lorain	Gen. Garrettson	440	420	52	28	23	12	22, 35, 58-42	13.9 x 11.6	Ellis & Eaves	170	6,500	Joseph Sellwood, Duluth.
Bay City	H. P. McIntosh	540	520	54	31	16	24	22 1/2, 36, 60-42	13.9 x 11.6	Ellis & Eaves	180	10,000	J. C. Gilchrist, Cleveland.
Bay City	Sheldon Parks	540	520	54	31	16	24	22 1/2, 36, 60-42	13.9 x 11.6	Ellis & Eaves	180	10,000	J. C. Gilchrist, Cleveland.
West Superior	Freighter, Pass Str.	552	532	56	31	32	12	23 1/2, 38, 63-42	14.6 x 11.6	Ellis & Eaves	180	10,000	W. A. & A. H. Hawgood, Cleveland.
Detroit	Freighter, Hy Phipps	524	504	54	30	30	12	22 1/2, 36, 60-42	13.9 x 11.6	Ellis & Eaves	180	9,000	E. D. Carter, Erie, Pa.
Bay City	Thos. Lynch	402	390	54	22	23	12	24, 32, 52-36	13.9 x 12	Howden	160	10,000	Detroit & Cleve. Steam Nav. Co., Detroit
South Chicago	Freighter, F. Baker	600	580	58	32	36	12	24, 39, 65-42	16 x 11.6	Ellis & Eaves	70	12,000	Pittsburg Steamship Co., Cleveland
West Superior	Freighter, Ed. H. Ohl	600	580	58	32	36	12	24, 39, 65-42	16 x 11.6	Ellis & Eaves	70	12,000	Pittsburg Steamship Co., Cleveland.
Detroit	Freighter, Ed. H. Ohl	524	504	54	30	30	12	22 1/2, 36, 60-42	13.9 x 11.6	Ellis & Eaves	180	9,000	Pittsburg Steamship Co., Cleveland.
Cleveland	Freighter, Ed. H. Ohl	552	532	56	31	32	12	23, 38, 63-42	14.6 x 11.6	Ellis & Eaves	180	10,000	C. O. Jenkins, Cleveland.
West Superior	Freighter, Ed. H. Ohl	552	532	56	31	32	12	23, 38, 63-42	14.6 x 11.6	Ellis & Eaves	180	10,000	Pickands, Mather & Co., Cleveland.
Chicago	Freighter, Ed. H. Ohl	552	532	56	31	32	12	18 1/2, 28 1/2, 43 1/2, 65-42	14.6 x 11.6	Ellis & Eaves	250	10,000	Acme Steamship Co., Duluth.
Lorain	Freighter, Ed. H. Ohl	440	420	52	28	23	12	22 1/2, 36, 60-42	14.6 x 11.6	Ellis & Eaves	180	10,000	W. A. & A. H. Hawgood, Cleveland.
Lorain	Freighter, Ed. H. Ohl	440	420	52	28	23	12	22 1/2, 36, 60-42	14.6 x 11.6	Ellis & Eaves	180	10,000	Lackawanna Steamship Co., Buffalo.
Lorain	Freighter, Ed. H. Ohl	440	420	52	28	23	12	22 1/2, 36, 60-42	14.6 x 11.6	Ellis & Eaves	180	10,000	Lackawanna Steamship Co., Buffalo.
Cleveland	Freighter, Ed. H. Ohl	440	420	52	28	23	12	22 1/2, 36, 60-42	13.9 x 11.6	Ellis & Eaves	180	10,000	Lackawanna Steamship Co., Buffalo.
Bay City	Freighter, Ed. H. Ohl	440	420	52	28	23	12	22 1/2, 36, 60-42	13.9 x 11.6	Ellis & Eaves	180	10,000	Lackawanna Steamship Co., Buffalo.
Detroit	Freighter, Ed. H. Ohl	440	420	52	28	23	12	22 1/2, 36, 60-42	13.9 x 11.6	Ellis & Eaves	180	10,000	Lackawanna Steamship Co., Buffalo.
Lorain	Freighter, Ed. H. Ohl	500	480	52	30	28	12	22 1/2, 36, 60-42	13.9 x 11.6	Ellis & Eaves	180	10,000	Lackawanna Steamship Co., Buffalo.
Lorain	Freighter, Ed. H. Ohl	500	480	52	30	28	12	22 1/2, 36, 60-42	13.9 x 11.6	Ellis & Eaves	180	10,000	Lackawanna Steamship Co., Buffalo.
Detroit	Freighter, Ed. H. Ohl	500	480	52	30	28	12	22 1/2, 36, 60-42	13.9 x 11.6	Ellis & Eaves	180	10,000	Lackawanna Steamship Co., Buffalo.
Detroit	Freighter, Ed. H. Ohl	500	480	52	30	28	12	22 1/2, 36, 60-42	13.9 x 11.6	Ellis & Eaves	180	10,000	Lackawanna Steamship Co., Buffalo.
Chicago	Freighter, Ed. H. Ohl	524	504	54	30	30	12	22 1/2, 36, 60-42	13.9 x 11.6	Ellis & Eaves	180	10,000	Lackawanna Steamship Co., Buffalo.
Lorain	Freighter, Ed. H. Ohl	524	504	54	30	30	12	22 1/2, 36, 60-42	13.9 x 11.6	Ellis & Eaves	180	10,000	Lackawanna Steamship Co., Buffalo.
Buffalo	Pack, Tug	350	320	46	30	10	24	19, 27, 40, 58-42	15.4 x 11.6	Ellis & Eaves	180	7,000	W. H. Becker, Cleveland.
Buffalo	Tug	186	180	43	21			22, 36, 60-30	11.6 x 11.6	Howden	210	5,000	S. B. Cranage, Bay City, Mich.
West Superior	Freighter, Jno. Mitchell	552	532	56	30	32	12	22, 36, 60-30	15 x 12	National	180	10,000	H. K. Oakes, Detroit.
GREAT LAKES ENGINEERING WORKS, DETROIT, MICH.													
St. Clair	Freighter, W. B. Davock	440	420	52	28	12	24	21-34 1/2, 57-42	13 x 12	Induced	175	7,000	J. H. Walsh, Detroit.
St. Clair	Freighter, W. B. Davock	440	420	52	28	12	24	21-34 1/2, 57-42	13 x 12	Induced	175	7,000	Anchor Line, Buffalo.
Ecorse	Freighter, F. Cole	600	580	58	32	36	12	24-37 1/2, 65-42	16 x 12	Induced	170	12,000	Great Lakes Towing Co., Cleveland.
Ecorse	Freighter, F. Cole	552	532	56	31	32	12	24-37 1/2, 65-42	16 x 12	Induced	170	12,000	The Pittsburg Steamship Co., Cleveland
Ecorse	Freighter, F. Cole	552	532	56	31	32	12	24-37 1/2, 65-42	16 x 12	Induced	170	12,000	William P. Snyder, Pittsburgh, Pa.
Ecorse	Freighter, F. Cole	552	532	56	31	32	12	24-37 1/2, 65-42	16 x 12	Induced	170	12,000	Pickands, Mather & Co., Cleveland.
Ecorse	Freighter, F. Cole	552	532	56	31	32	12	24-37 1/2, 65-42	16 x 12	Induced	170	12,000	Jas. E. Davidson & H. L. Shaw, Bay City.
Ecorse	Freighter, F. Cole	552	532	56	31	32	12	24-37 1/2, 65-42	16 x 12	Induced	170	12,000	York Steamship Co., Buffalo.
Ecorse	Freighter, F. Cole	552	532	56	31	32	12	24-37 1/2, 65-42	16 x 12	Induced	170	12,000	Eastern Interests Unannounced.
Ecorse	Freighter, F. Cole	552	532	56	31	32	12	24-37 1/2, 65-42	16 x 12	Induced	170	12,000	Rutland Transit Co., Ogdensburg, N. Y.
Ecorse	Freighter, F. Cole	552	532	56	31	32	12	24-37 1/2, 65-42	16 x 12	Induced	170	12,000	Rutland Transit Co., Ogdensburg, N. Y.
Ecorse	Freighter, F. Cole	552	532	56	31	32	12	24-37 1/2, 65-42	16 x 12	Induced	170	12,000	Western Transit Co., Buffalo.
Ecorse	Freighter, F. Cole	552	532	56	31	32	12	24-37 1/2, 65-42	16 x 12	Induced	170	12,000	Ohio Interests Unannounced.

CANADIAN SHIPBUILDING CO., TORONTO, ONT.

Toronto	Pass. Str.	240	230	41	10	2 engines Four cyl. trip. 15 $\frac{1}{2}$, 24, 30, 30-22	Two Scotch 14.4Dx12	forced	180	Rich. & Ont. Nav. Co., Montreal P. Q.
Toronto	Car Ferry	316	306	51	20 $\frac{1}{2}$	2 engines 20 $\frac{1}{2}$, 32 $\frac{1}{2}$, 54-36	Four Scotch 14.0Dx12.0	forced	175	Ontario Car Ferry Co., Montreal, P. Q.
Toronto	Quarantine Str.	128	120	26	12	2 engines 12, 26-16	Two Scotch 9.9Dx11.0	Natural	160	Dominion Government Ottawa, Ont.
Toronto	Alligator Scow	66	65	14	6					Upper Ottawa Improvement Co., Ottawa, Ont.
Toronto	Alligator Scow	66	65	14	6					Upper Ottawa Improvement Co., Ottawa, Ont.
Niagara S'Yd.	Freighter.	510	491	56	31	1 engine 19, 28, 40, 58-42	Three Scotch 12.0Dx12.0	forced	210	St. Lawrence & Chicago Steam Nav. Co., Toronto, Ont.
Niagara S'Yd.	Pass. Str.	120	115	23	8	2 engines 7 $\frac{1}{2}$, 12, 19 $\frac{1}{2}$ -12	One Scotch 10.0Dx11.0	Natural	175	Muskoka Lakes Nav. and Hotel Co., Gravenhurst, Ont.

COLLINGWOOD SHIP BUILDING CO., COLLINGWOOD, ONT.

Midland Prince	486	466	55	31	14	21	23, 38 $\frac{1}{2}$, 63-42	Two Scotch 15.6x12	Natural	185	5,100	Midland Navigation Co. Ltd., Midland, Ont.
Tug	115	111	23	13			15, 25, 42-25	One Scotch 13.6x10.6	Natural	185	270	Department of Public Works of Canada.
Hopper	144		3	11.5			Steam Operating Gear				500yds.	Department of Public Works of Canada.
Hopper	144		30	11.5			Steam Operating Gear				500yds.	Department of Public Works of Canada.
Hopper	144		30	11.5			Steam Operating Gear				500yds.	Department of Public Works of Canada.
Freighter	406	386	50	28		24	21, 35, 57-42	Two Scotch 14.6x12	Natural	180	5,500	Farrar Transp. Co., Collingwood, Ont.

TOLEDO SHIP BUILDING CO., TOLEDO, O.

Toledo	Freighter.	480	440	53	29	3	24	16 $\frac{1}{2}$, 24, 35, 51-42	12.6 x 12	Ellis & Eaves	210	7,000	Smith & Wilkinson, Syracuse, N. Y.
Toledo	Freighter.	480	440	53	29	13	24	16 $\frac{1}{2}$, 24, 35, 51-42	12.6 x 12	Ellis & Eaves	210	7,000	Smith & Wilkinson, Syracuse, N. Y.
Toledo	Freighter.	524	504	53	30	13	24	20, 24, 42, 61-42	12.6 x 12	Ellis & Eaves	210	9,000	Smith & Wilkinson, Syracuse, N. Y.

MANITOWOC DRY DOCK CO., MANITOWOC, WIS.

Manitowoc	Pass. S. r.	270	250	42	17		Two 23, 38, 62-36	Three 12.6x11	Induced	180	1,700	Goodrich Transit Co., Chicago.
Manitowoc	Hydraulic Dredge	140	140	36	10.6		17, 24, 45-24	Two 11.6x18	Natural	160	750	Park Commissioners Lincoln Park Chicago.
Manitowoc	Dump Scow	150	106	26	12.6						750 cu. yds.	Duluth-Superior Dredging Co., Duluth.
Manitowoc	Dump Scow	150	106	26	12.6						750 cu. yds.	Duluth-Superior Dredging Co., Duluth.

POLSON IRON WORKS, TORONTO.

Toronto	Car Ferry	280	248	40	22		Two 22 42-30	Four Scotch	Howden	130		Canadian Pacific Co. and Passenger Transfer Co., Prescott, Ont.
Toronto	Chas. Lyon Tug	105	96	23	13		13 $\frac{1}{2}$, 22, 36-21	Water Tube		200		Dominion Government.
Toronto	Hercules Dredge	110		38	11		Horizontal Engines	Clyde		140		Dominion Government.
Toronto	Scow	138		30.6	11.6		Steam raising and lowering gear			125		Dominion Government.
Toronto	Scow	136		30.6	11.6		Steam raising and lowering gear			125		Dominion Government.
Toronto	Tug	80	73	17	7.6		9 18-14	Fitz Giblin		150		Dominion Government.

JOHNSTON BROS., FERRYSBURG, MICH.

Ferrysburg Mich.	Harbor Tug	87	75	21	12		16, 3-26	Scotch 11x12	Natural	150	120	Buffalo Dredging Co., Buffalo, N. Y.
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HYDRAULIC DREDGE FOR CHICAGO.

There is being completed at the yard of the Manitowoc Dry Dock Co. for the Board of Park Commissioners, Lincoln Park, Chicago, the hydraulic dredge, a photograph of which is shown in advertisement of this issue. This dredge is of the open-end hydraulic type, digging to a depth of 33 ft. and making a clear cut of 175 ft. wide, described in a radius. Two large spuds at the stern are used for anchoring and upon one of which the dredge swings while making the cut. She is also held by wire cable anchorages forward and aft. The engines are of the triple-expansion type, 17, 32 and 45-in. cylinder diameter by 24-in. stroke, operating a pump 30 in. diameter with a capacity of 1,500 cubic yards per hour. There are two double-ended Scotch boilers 18 ft. long, 11 ft., 6 in. diameter, carrying a pressure of 160 lbs. The cutter is 7 ft. in diameter with ten blades, supported on a substantial frame 50 ft. long, through which the suction pipe is run. The cutter is operated by a double tandem compound engine 10 in. and 20 in. by 18-in. stroke located at one side of the well. The dredge is installed with a complete electric light plant including search light—all wires being run in pipe conduits. There are accommodations

furnished for thirty-five men working in a double shift.

The dredge was designed by Mr. A. W. Robinson, of Montreal, Canada. The contract was taken by the Atlantic Equipment Co., of New York City, who sublet the hull construction to the Manitowoc Dry Dock Co., Manitowoc, Wis. The work is being supervised by Mr. Thomas Jardine of New York, who has had extensive experience with dredges of this class. When completed, it will be the most modern and complete machine afloat and the largest of its type in this country.

EMPIRE SHIP BUILDING CO.

The Empire Ship Building Co., of Buffalo launched on Dec. 22, the first of the two 500-cu. yd. steel dump scows which it is building for the Empire Engineering Corporation of New York City. Mr. F. W. Allan, general superintendent of the Empire Engineering Corporation, was present, and the scow was christened by Mrs. Allan. The construction of the second scow is well under way and it will probably be finished about Jan. 30. The company is also building a large steel sand sucker to be fully equipped for David Hyman, Rochester, N. Y., and has a large amount of repair work under way.

MISCELLANEOUS NOTES.

Included in the estimates submitted by Secretary Shaw to congress for the next fiscal year is one of \$972,500 for improvements at League island,

Thomas McCosker & Co., Baltimore, Md., are building a car float for the Western Maryland Railroad Co., to be 177 ft. long over all, valued at \$16,000. This company is also building a pile driver for Mr. Andrew Miller of Baltimore, Md., 65 ft. long, to cost \$3,000.

The Phoenix Foundry & Locomotive Works, St. John, N. B., are building four steel hopper barges for the Dominion government. These barges are 105 ft. long, 22 ft. beam and 9 ft. deep, and are intended to carry about 200 cu. yds. of material. They are not self-propelling, but are fitted with large winches for opening and closing hopper doors.

The Gray & Prior Machine Co., Hartford, Conn., has just put out a very attractive little catalog descriptive of the Hartford two-cycle gasoline marine engine. The catalog is illustrated with excellent drawings of the various parts of the engine and gives as well a fine detailed description of it. Lightness combined with great strength and few parts are features in the general design.

United States Naval Program.

There are at present twenty-two ships building for the United States navy as against thirty-two a year ago. During the year the following war ships have gone into commission: Battleships Virginia, Georgia, New Jersey, Rhode Island, Connecticut and Louisiana; armored cruisers Tennessee and Washington; protected cruiser Milwaukee, steel training ship Intrepid, and torpedo boat Goldsborough. The twenty-two ships under construction represent a displacement of 216,058 tons; horsepower of 299,000; and a monetary value, exclusive of armor and armament, of \$55,796,600. In this program of twenty-two ships only two are additions to the list last year, the battleships South Carolina and Michigan. Cramps are to build one of these battleships and the New York Ship Building Co. the other. They are to displace 16,000 tons and to have a speed of 18½ knots. Tentative designs have been submitted for a battleship to exceed in displacement, offensive and defensive qualities the Dreadnaught, recently added to the British navy, and shipbuilders will undoubtedly be asked during the year to bid upon its construction. Other additions will also be made. So far the United States navy has not exploited the turbine except in two scout cruisers now under construction, one to be equipped

with Curtis turbines by the Fore River Ship Building Co., and the other with Parsons turbines by the Bath Iron Works. It is likely, however, that proposals will be considered to equip the new battleship with turbines. The naval program actually under construction consists of nine battleships, four armored cruisers, one protected cruiser, one training ship, three scout cruisers, and four submarines.

It is gratifying to announce that the coast shipyards are busier on merchant work than they have been for several years past. With two exceptions, however, all of the work in the coast shipyards is for coastwise trade. The movement, however, to remove the handicap under which American ships are now operating in the foreign trade has recently received much encouragement, and there is every reason to believe that a bill extending aid to foreign shipping will be passed at the present session of congress. The bill drafted by the Merchant Marine Commission has already passed the senate and President Roosevelt is expected to shortly give it the emphatic endorsement of a special message. There is every reason to believe that the house will pass a bill before it adjourns in March. As soon as it does, an activity unprecedented in years, may be expected in every coast yard.

Vessels under Construction for the United States Navy.

Name.	By whom and where building.	Contract date of completion.	Dimensions, ft., in. Normal condition.			Displacement (normal).	I. H. P. (esti- mated.)	Speed knots (estimated).	Type of engine.	Type of boilers.	Contract price of hull and machinery.
			Length between perpen- diculars.	Breadth on L. W. L.	Mean draught						
Battleships.											
Nebraska.....	Moran Bros. Co., Seattle, Wash.	Mar. 7, 1904	435	76 2½	23 9	14,948	19,000	19	Trip.exp., twin screw	Bab. & Wil....	\$3,733,600
Vermont.....	Fore River Co., Quincy, Mass.	Dec. 20, 1903	450	76 10	24 6	16,000	16,500	18	Trip.exp., twin screw	Bab. & Wil....	4,179,000
Kansas.....	New York S. B. Co., Camden, N. J.	Dec. 16, 1903	450	76 10	24 6	16,000	16,500	18	Trip.exp., twin screw	Bab. & Wil....	4,165,000
Minnesota.....	Newport News Co., Newport News	Dec. 20, 1903	450	76 10	24 6	16,000	16,500	18	Trip.exp., twin screw	Bab. & Wil....	4,110,000
Mississippi.....	Cramp & Sons, Philadelphia.....	Mar. 25, 1904	375	77	24 8	13,000	10,000	17	Trip.exp., twin screw	Bab. & Wil....	2,999,500
Idaho.....	Cramp & Sons, Philadelphia.....	May 25, 1904	375	77	24 8	13,000	10,000	17	Trip.exp., twin screw	Bab. & Wil....	2,999,500
New Hampshire.....	New York S. B. Co., Camden, N. J.	Feb. 27, 1904	450	76 10	24 6	16,000	16,500	18	Trip.exp., twin screw	Bab. & Wil....	3,748,000
South Carolina.....	Cramp & Sons, Philadelphia, Pa.	Dec. 21, 1903	450	76 10 2½	24 6	16,000	16,500	18½	Trip.exp., twin screw	Water tube	3,540,000
Michigan.....	New York S. B. Co., Camden, N. J.	Nov. 20, 1903	450	76 10 2½	24 6	16,000	16,500	18½	Trip.exp., twin screw	Water tube	3,585,000
Armored Cruisers.											
California.....	Union Iron Works, San Francisco	Jan. 10, 1904	502	89 6¼	24 1	13,680	23,000	22	Trip.exp., twin screw	Bab. & Wil....	3,800,000
South Dakota.....	Union Iron Works, San Francisco	Jan. 10, 1904	502	89 6¼	24 1	13,680	23,000	22	Trip.exp., twin screw	Bab. & Wil....	3,750,000
North Carolina.....	Newport News Co., Newport News	Jan. 3, 1904	502	72 10½	25	14,500	23,000	22	Trip.exp., twin screw	Bab. & Wil....	3,575,000
Montana.....	Newport News Co., Newport News	Jan. 3, 1904	502	72 10½	25	14,500	23,000	22	Trip.exp., twin screw	Bab. & Wil....	3,575,000
Protected Cruisers.											
Milwaukee.....	Union Iron Works, San Francisco	Apr. 17, 1904	424	66	22 6	9,700	21,000	22	Trip.exp., twin screw	Bab. & Wil....	2,825,000
Steel Training Ships.											
Cumberland.....	Navy Yard, Boston.....		176 5	45 8	16 5	1,800			Sail power.....		a 410,000
Scout Cruisers.											
Chester.....	Bath Iron Works.....	May 4, 1904	420	47	16 9	3,750	16,000	24	Four screw, turbine	Water tube	1,688,000
Birmingham.....	Fore River Ship Bldg. Co.....	Nov. 17, 1903	420	47	16 9	3,750	16,000	24	Twin screw, trip.exp.	Water tube	1,556,000
Salem.....	Fore River Ship Bldg. Co.....	Mar. 17, 1904	420	47	16 9	3,750	16,000	24	Twin screw, turbine	Water tube	1,556,000
Submarines.											
Octopus.....	Fore River Ship Bldg. Co.....										
Viper.....	Fore River Ship Bldg. Co.....										
Cuttlefish.....	Fore River Ship Bldg. Co.....										
Tarantula.....	Fore River Ship Bldg. Co.....										

a Limit of cost.

SOMETHING NEW IN PAINT.

The days of the big steel boats is upon us. Wooden boats obtain strength by concentrating the material in big timbers; the steel boats in great surfaces. Attention is called that these thin sheets of steel must be protected against corrosion. This constant eating away by rust may easily go on and lay the whole

vessel open to great danger.

Insurance people base their rates on present conditions and not the condition at launching. A mechanical structure is no stronger than its weakest point. It is up to the owner to anticipate and prevent this decay as he alone must make good when the final balance is struck.

A thin coating durable and elastic

is the best known preventative of rust and preserver of sheet steel. The Toledo White Lead Co.'s Zenith anti-rust coating was designed to meet the requirements of a weather proof coating to protect every part of a vessel exposed to corrosion and within the allowable cost of operation. It has been tested and tried with the best results.

Merchant Work in Coast Yards.

Wm. Cramp & Sons Ship & Engine Building Co., Philadelphia, Pa.:

Steamer Antilles for the Southern Pacific Co., Pier 25, North River, New York; length over all, 440 ft.; estimated gross tonnage, 6,900; one triple-expansion engine; three double and four single end boilers; 7,000 horsepower.

Steamers Havana and Saratoga, duplicates, for the New York & Cuba Mail, New York; length, 413 ft.; estimated gross tonnage, 6,000; two triple-expansion engines; eight single-end boilers; 6,500 horsepower.

Steamers Massachusetts and Commonwealth for the New England Navigation Co.; length over all, 395 ft.; estimated gross tonnage, 3,500; two triple-expansion engines, four-cycle; eight single-end boilers; 7,000 horsepower.

Steamer Old Colony for the New England Navigation Co.; length over all, 395 ft.; estimated gross tonnage, 3,500; three turbine engines; 7,000 horsepower.

Newport News Ship Building & Dry Dock Co., Newport News, Va.:

Steel oil steamer for the Sun Co., Philadelphia, Pa.; length, 405 ft., 5 in. over all, three-cylinder, triple-expansion engine; three Scotch boilers; 2,000 horsepower.

Steel freight and passenger steamer for the New York & Texas Steamship Co., New York City; length over all, 416 ft. 6 in.; twin screw, four-cylinder quadruple-expansion engine; eight Scotch boilers; 6,500 horsepower.

Three steel car floats for the Delaware, Lackawanna & Western railroad, Hoboken, N. J., 255 ft. over all.

Six steel dump barges, 127 ft. 5 in. over all, for the Isthmian Canal Commission, Washington, D. C.

Dredge hull, 125 ft. over all, for the American Locomotive Co., Richmond, Va.

Six double-ended and four double-ended boilers for steamer St. Paul, belonging to the International Mercantile Marine Co., New York City.

Lengthening steamer Jefferson 46 ft. for the Old Dominion Steamship Co., and also lengthening steamer Essex 36 ft. for the Merchants and Miners' Transportation Co.

Maryland Steel Co., Sparrow's Point, Md.:

Steel freight steamer Tuscan for the Boston & Philadelphia Steamship Co., Boston, Mass.; length over all, 290 ft.; approximate value, \$330,000; estimated gross tonnage, 2,500; three-cylinder, triple-expansion engine; four single-end Scotch boilers; estimated horsepower 2,700.

Two steel sea-going suction dredges, duplicates, for the Isthmian Canal Commission, Washington, D. C.; length over all, 280 ft.; approximate value, \$362,425; estimated gross tonnage, 2,500; compound, twin-screw engine; four single-end Scotch boilers; estimated horsepower, 2,000.

Steel passenger steamer for the Baltimore Steam Packet Co., Baltimore, Md.; length over all, 306 ft.; approximate value, \$350,000; estimated gross tonnage, 2,200; four-cycle, triple-expansion engines; four single-end Scotch boilers; estimated horse power, 2,400.

Steel freight and passenger steamer for the New York, Philadelphia & Norfolk Railroad Co., Philadelphia, Pa.; length over all, 260 ft.; approximate value, \$250,000; estimated gross tonnage, 1,352; three-cylinder, triple-expansion engine; four single-end Scotch boilers; estimated horsepower, 2,000.

Two Scotch boilers, 10 ft. 9 in. diameter by 10 ft. 9 in. long, for steam schooner Sebyl Marston, building by W. A. Boole & Son, Oakland, Cal.

Fore River Ship Building Co., Quincy, Mass.:

Steel freight and passenger steamer Creole for the Southern Pacific Co. (Morgan Line), New York City; length over all, 440 ft.; estimated gross tonnage, 6,000; twin screw, seven stage, Curtis marine reversible turbine engines; ten Babcock & Wilcox water-tube boilers, with superheaters; 8,000 horsepower.

Steel freight steamers Ocmulgee, Ogeechee and Ossabaw, duplicates, for the Brunswick Steamship Co., Brunswick, Ga.; length over all, 313 ft.; estimated gross tonnage, 2,667; single-screw, triple-expansion engines; two single-ended Scotch boilers; 1,200 horsepower.

Three steel freight steamers, duplicates, for the New England Coal & Coke Co., Boston, Mass.; length over all, 400 ft.; dead weight carrying capacity, 7,200 gross tons; single screw, triple-expansion engines; four single-end Scotch boilers and one Donkey boiler; 2,700 horsepower.

Harlan & Hollingsworth Corporation, Wilmington, Del.:

Steel light-house tender Sunflower for United States government, Washington, D. C.; length over all, 173 ft. 6 in.; estimated gross tonnage, 822; two triple-expansion engines with 12, 19 and 32-in. cylinder diameters by 24-in. stroke; two Scotch boilers, 11 ft. 9 in. by 12 ft.; 1,000 horsepower.

Steel wrecking steamer Relief for the Merritt-Chapman Derrick & Wrecking

Co., New York City; length over all, 200 ft.; estimated gross tonnage, 945; one triple-expansion engine, 18, 30 and 50-in. cylinder diameters by 30-in. stroke; two Scotch boilers, 13 ft. by 13 ft.; 1,200 horsepower.

Steel tug boat El Toro for the Southern Pacific Co., New York City; length over all, 115 ft.; estimated gross tonnage, 300; one compound engine, 20 and 45-in. cylinder diameters by 28-in. stroke; two Scotch boilers, 12 ft. by 10 ft. 8½ in.; 850 horsepower.

Steel tug boat El Chico for the Southern Pacific Co., New York City; length over all, 90 ft.; estimated gross tonnage, 200; one compound engine, 15 and 32-in. cylinder diameters by 22-in. stroke; one Scotch boiler, 11 ft. 6 in. by 10 ft. 11 in.; 650 horsepower.

Steel Steamers Delaware and Pawnee, duplicates for the Clyde Steamship Co., New York City, length over all, 267 ft.; estimated gross tonnage, 2,600; one triple-expansion engine, 19, 30 and 50-in. cylinder diameters by 30-in. stroke; two Scotch boilers, 12 ft. 9 in. by 11 ft.; 1,200 horsepower.

Steel steamer St. Helens for E. J. Dodge Lumber Co., San Francisco, Cal.; length over all, 232 ft.; estimated gross tonnage, 3,000; one triple-expansion engine, 19, 30 and 50-in. cylinder diameters by 36-in. stroke; two Scotch boilers, 12 ft. by 11 ft. 6 in.; 1,100 horsepower.

Steel steamer for lumber trade for Olsen, Mahoney & Co., San Francisco, Cal.; length over all, 232 ft.; estimated gross tonnage, 3,000; one triple-expansion engine, 19, 30 and 50-in. cylinder diameters by 36-in. stroke; two Scotch boilers, 12 ft. by 11 ft. 6 in.

Three steel ferry boats, duplicates, for New York City; length over all, 209 ft.; estimated gross tonnage, 4,200; coupled compound engines, 18 and 38-in. cylinder diameters by 28-in. stroke; four Scotch boilers, 11 ft. by 10 ft. 6 in.; 6,000 horsepower.

Three steel car floats, duplicates, for the Central Railroad of New Jersey; length over all, 285 ft.; estimated gross tonnage, 2,100.

Union Iron Works, San Francisco, Cal.:

Twin-screw steel steamer Mexican for the American-Hawaiian Steamship Co., New York; length over all, 488 ft. 4 in.; estimated gross tonnage, 8,991; twin-screw, triple-expansion engine; four single-end Scotch boilers; horsepower, 3,600.

Twin-screw steel steamer Columbian for the American-Hawaiian Steamship Co., New York; length over all, 488 ft.

4 in.; estimated gross tonnage 8,991; twin-screw triple-expansion engine; four single-end Scotch boilers; 3,600 horsepower.

Steel steamer Isthmian for the American-Hawaiian Steamship Co., New York; length over all, 398 ft. 10 in.; estimated gross tonnage, 5,224; single-screw, triple-expansion engine; three single-end Scotch boilers; 2,750 horsepower.

Steel steamer Mauna Kea for the Inter Island Navigation Co.; length, 251 ft. 6 in.; estimated gross tonnage, 1,549; single-screw, triple-expansion engine; two single-end Scotch boilers; 2,200 horsepower.

American Car & Foundry Co., Wilmington, Del.:

Two wooden car floats, duplicates, for the Philadelphia & Reading Railway Co., Philadelphia, Pa.; 176 ft. long; 33-ft. beam and 7 ft. 8 in. deep; estimated gross tonnage, 468.

Two wooden car floats, duplicates, for the Atlantic City Railroad Co., Philadelphia, Pa.; 176 ft. long; 33-ft. beam, and 7 ft. 8 in. deep; estimated gross tonnage, 468.

Two wooden dredging scows, duplicates, for A. Mackenzie, New York; 138 ft. long; 38-ft. beam, and 14 ft. deep; estimated gross tonnage, 775.

Two wooden dredging scows duplicates, for the Columbia Dredging Co., New York; 125 ft. long; 36-ft. beam, and 14 ft. deep; estimated gross tonnage, 663.

Four wooden coal barges, duplicates, for the Pennsylvania Railroad Co., New York; 114 ft. long; 26-ft. beam, and 13 ft. deep; estimated gross tonnage, 410.

Four wooden coal barges, duplicates, for the Pennsylvania Railroad Co., New York; 130 ft. long; 30-ft. beam, and 40 ft. deep; estimated gross tonnage, 575.

John H. Dialogue & Son, Camden, N. J.:

Steel tug Pocomoke for the New York, Philadelphia & Norfolk railroad, Philadelphia, Pa.; length over all, 140 ft. 2 in.; approximate value, \$85,000; estimated gross tonnage, 296; triple-expansion engine; one Scotch boiler; 800 horsepower.

One triple-expansion engine and one Scotch boiler for Tucker & Walker, Philadelphia, Pa.; 700 horsepower.

Steel tug for the Long Island Railroad Co., Long Island City, N. Y.; length over all, 100 ft. 6 in.; approximate value, \$60,000; estimated gross tonnage, 190; compound engine; two Almy water-tube boilers; 500 horsepower.

Steel tug for Reynolds & Co., Philadelphia, Pa.; length over all, 115 ft. 6 in.; approximate value, \$70,000; estimated gross tonnage, 230; triple-expansion engine; one Scotch boiler; 600 horsepower.

Steel tug for Du Boise & Co., New York; length over all, 121 ft.; approximate value, \$80,000; estimated gross tonnage, 250; triple-expansion engine; one Scotch boiler; 700 horsepower.

Two steel tugs, duplicates, for the Shipowners & Merchants Tugboat Co., San Francisco, Cal.; length over all, 150 ft.; approximate value, \$95,000 each; estimated gross tonnage, 320; triple-expansion engine, one Scotch boiler; 900 horsepower.

Two boilers for the Baltimore & Philadelphia Steamboat Co., Philadelphia, Pa.

W. & A. Fletcher Co., Hoboken, N. J.:

Steamer Yale for the Metropolitan Steamship Co., New York; length over all, 407 ft.; approximate value, \$1,000,000; triple-screw, Parsons turbine engines; estimated horsepower, 10,000.

Steamer Harvard for the Metropolitan Steamship Co., New York; length over all, 407 ft.; approximate value \$1,000,000; triple-screw, Parsons turbine engines; estimated horsepower, 10,000.

New paddle steamer for the Peoples Line, (Hudson Navigation Co.) New York; length over all, 438 ft.; approximate value, \$1,000,000; simple vertical beam surface condensing engine; estimated horsepower, 4,500.

West Oakland Ship Yards of Southern Pacific Co., West Oakland, Cal.

Wooden side-wheel ferry steamer for the Southern Pacific Co., Oakland, Cal.; length over all, 268 ft.; beam 42½ ft.; depth of hold, 18 ft.; approximate value, \$152,000; estimated gross tonnage, 2,197; tandem compound inclined engine, 22½ and 38¾ in. cylinder diameters by 96-in. stroke; four Scotch dry back boilers, 175 lbs. steam pressure; 2,000 horsepower.

Wooden stern wheel freight and passenger river steamer for the Southern Pacific Co., Oakland, Cal.; length over all, 220 ft.; beam, 44 ft.; depth 9 ft.; approximate value, \$80,000; estimated gross tonnage, 900; tandem compound horizontal engine, 22½ and 38¾ in. cylinder diameters by 96-in. stroke; 18-ft. shell locomotive type boiler, 175 lbs. steam pressure; 2,000 horsepower.

Gillett & Eaton, Lake City, Minn., are building Gillett's patent balanced valve, variable cut-off steamboat engines for the following steamers: City of Prince Albert, Wertchper, Erberhart, Newport, Yakima, Satellite, ferry Alice, ferry Why-Not, and four additional ferries.

The St. Lawrence Marine Railway Co., Ogdensburg, N. Y., have remodeled the propeller Denver, for the Daly & Hannan Dredging Co., making a bucket dredge of her. This

company is largely engaged in repair work.

The Thames Tow Boat Co., New London, Conn., is very busily engaged in repair work to vessels, both wooden and steel, and boilers and machinery. This company has the largest railways, suitable of taking out large class of vessels, between Boston and New York, and have boiler shop, machine shop, etc., on the premises.

J. T. Sharpley, Franklin City, Va., is negotiating with the Standard Oil Co., to build a wharf for an oil station near the ways which would be a great convenience to gasoline boats.

Gas Engine & Power Co., and Charles L. Seabury & Co., Cons., Morris Heights, New York.

Twin-screw steel steam yacht for Mr. Cyrus Curtiss; length over all, 175 ft.; beam, 20 ft.; Seabury triple-expansion engine and Seabury water-tube boilers.

Single-screw steel steam yacht, 140 ft. long, for Frank J. Hecker, Detroit.

Springfield Boiler & Manufacturing Co., Springfield, Ill.:

Self-propelling dredge B. M. Harrod for the Mississippi River Commission, length over all, 210 ft.; compound engines, built by the Detroit Ship Building Co., Detroit, for propelling side paddle wheels; nine 5-flue Mississippi River type boilers, 47 in. diameter by 28 ft.; main dredge pump centrifugal 36 in. discharge driven by 1,500 H. P. high speed engines; electric light plant operated by De Laval turbine plant.

Steel harbor boat for the city of St. Louis, 180 ft. over all; side paddle type with four 44-in. by 26 ft. 6-flue Mississippi river type boilers. For description of this harbor tug see MARINE REVIEW of May 3, 1906.

T. S. Marvel Ship Building Co., Newburg, N. Y.:

Twin-screw steel steamer for the Quartermaster's Department, United States Army, length over all, 86 ft.; estimated gross tonnage, 130; compound engine and Scotch boiler 350 H. P.

Steel towing steamer New York Central No. 2 for the New York Central & Hudson River Railroad Co.; length over all, 105 ft.; estimated gross tonnage, 230; compound engine and leg boiler, 750 H. P.

Steel passenger steamer for W. P. Drake; length over all, 115 ft.; estimated gross tonnage, 180; compound engine and water-tube boilers, 500 H. P.

Two steel hulls, duplicates, for the New York City Fire Department; length over all, 131 ft.; estimated gross tonnage, 450 each.

Hull for side-wheel steel steamer Robert Fulton for the Hudson River Day

line; length over all, 400 ft.; estimated gross tonnage, 4,000; 6,000 H. P.

J. W. Dickie, San Francisco, Cal.:

Wooden ferry boat for the San Francisco, Oakland & San Jose Railway Co., Oakland, Cal.; length over all, 203 ft.; approximate value, \$200,000; estimated gross tonnage, 1,070; two single-screw compound engines; two Babcock & Wilcox boilers, 2,000 H. P.

Wooden barge for carrying crushed rock for the San Pablo Quarry Co., of Oakland, Cal.; length over all, 130 ft.; approximate value, \$20,000; estimated gross tonnage, 300.

Pusey & Jones Co., Wilmington, Del.:

Three twin-screw steamers, 86 ft. long, for the United States Quartermaster Department; two compound vertical inverted direct-acting engines, 7½ in. and 15 in. by 14 in.; one Scotch boiler, 10 ft. 6 in. inside diameter by 11 ft. 6 in. long; working pressure 156 lbs. per square inch. 135 horsepower.

Twin-screw steel Revenue cutter for the United States Revenue Cutter Service; length over all, 158 ft.; two vertical, inverted direct-acting triple-expansion engines, 8 in., 13¼ in. and 22-in. cylinder diameters by 18 in. stroke; one Babcock & Wilcox water-tube boiler, working pressure of 200 lbs.; heating surface, 3,100 sq. ft.; grate surface, 75 sq. ft.; 600 horsepower. One Scotch donkey boiler built for a working pressure of 200 lbs.

Gas Engine & Power Co. and Charles L. Seabury & Co., Cons., Morris Heights, New York.:

Schooner rig steel steam yacht for Cyrus H. K. Curtis, Philadelphia, Pa.; length over all, 175 ft.; estimated gross tonnage, 250; two Seabury triple-expansion engines; two Seabury water-tube boilers; estimated horsepower, 1,200.

Schooner rig steel steam yacht for Frank J. Hecker, Detroit, Mich.; length over all, 140 ft.; estimated gross tonnage, 165; one Seabury triple-expansion engine; one Seabury water-tube boiler; estimated horsepower, 400.

Also an approximate total gross tonnage of 100 in gasoline and naphtha launches under construction.

Arthur D. Story, Essex, Mass.:

Fishing boat Romance for H. Parkhurst & Son, Gloucester, Mass.; length over all, 121 ft.; approximate value, \$14,000; estimated gross tonnage, 130.

Fishing boat Inseman for Wallace & Keeny, New York; length over all, 105 ft.; approximate value, \$11,000; estimated gross tonnage, 95.

Fishing boat Terranora for T. J. O'Hara, Boston, Mass.; length over all, 116 ft.; approximate value, \$13,500; estimated gross tonnage, 130.

Fishing boat Effie M. Prior for M.

Walen & Son, Gloucester, Mass.; length over all, 124 ft.; approximate value, \$15,000; estimated gross tonnage 138.

Fishing boat Morning Star for T. J. O'Hara, Boston, Mass.; length over all, 118 ft.; approximate value, \$14,600; estimated gross tonnage, 126.

Fishing boat Roanoke for Bulder; length over all, 100 ft.; approximate value, \$9,500; estimated gross tonnage, 82.

Southern Ship Building Co., Jacksonville, Fla.:

Four-masted wooden schooner Jacksonville for Jacksonville parties; length over all, 188 ft.; approximate value, \$50,000; estimated gross tonnage 580.

Twelve lighters for Florida East Coast Railway; 100 ft. over all; 30-ft. beam and 7 ft. 6 in. deep; approximate value, \$4,000. All duplicates.

Two lighters, duplicates, for the Florida East Coast Railway; 70 ft. over all; 40-ft. beam and 8 ft. deep; approximate value, \$4,000.

James Rees & Sons Co., Pittsburg, Pa.:

Steel steamer Cardinas for Mexican parties; length over all, 108 ft.; approximate value, \$40,000; estimated gross tonnage, 175; high pressure engine; locomotive boiler; 100 horsepower.

Howard's Ship Yard Co., Jeffersonville, Ind.:

One wooden side-wheel steamer, 245 ft. long; two high pressure engines, cylinders 24-in. diameter by 9-in. stroke.

One stern-wheel steamer, wood, 165 ft. long; one stern-wheel steamer, wood, 175 ft. long; two stern-wheel steamers of steel, 150 ft. long.

Portland Ship Building Co. Portland, Me.:

Wooden towboat Pejepsco for the Bay Shore Lumber Co., Brunswick, Me.; length over all, 100 ft.; approximate value, \$40,000; estimated gross tonnage, 120; compound engine, one Scotch boiler; 500 horsepower.

F. S. Bowker & Son, Phippsburg, Me.:

Three-masted wooden schooner for Rufus During Co., 390 Commercial St., Portland, Me.; length over all, 155 ft.; approximate value, \$25,000; estimated gross tonnage, 330.

Sawyer Bros., Milbridge, Me.:

Wooden sailing vessel for the market; length over all, 152 ft.; approximate value, \$2,700; estimated net tonnage, 275.

George Lawley & Sons Corporation, South Boston, Mass.:

Three-masted auxiliary steel schooner for H. W. Putman, New York; length over all, 180 ft.; one triple-expansion Lawley engine; two Almy water-tube boilers; 750 horsepower.

Wooden schooner for H. P. King, Boston, Mass.; length, 80 ft.

Wooden naphtha launch for Marshall

& Spader; length, 79 ft.; one Standard engine; 100 horsepower.

Wooden naphtha launch for I. W. Clothier, Philadelphia, Pa.; length over all, 53 ft.; one Standard engine; estimated horsepower, 25.

Conrad Hildebrant, Rondout, N. Y.:

Wooden coal barge, 100 ft. long, for James McWilliams, New York City.

Wooden coal barge, 90 ft. long, for James McWilliams, New York City.

Wooden ice barge, 98 ft. long, for Charles Mulford, Glasco, N. Y.

Wooden deck scow, 110 ft. long, for Anthony O'Boyle, New York City.

Wooden coal barge, 100 ft. long, for the market.

Wooden coal barge, 90 ft. long, for the market.

Wooden brick scow, 112 ft. long, for George Washburn, Rondout, N. Y.

Wm. P. Kirk, Tom's River, N. J.:

Cat yacht for F. L. De Bosque, Jersey City, N. J.; length over all, 24 ft.; approximate value, \$600; estimated gross tonnage, 2.

Knockabout, 50 ft. over all; approximate value, \$3,000; estimated gross tonnage, 0¼. Name of owner for whom building not announced.

Evan Owen, Weems, Va.:

Wooden oyster dredger for Evan Owen; length over all, 50 ft.; approximate value, \$3,500; estimated gross tonnage, 16; gasoline engine; 30 horsepower.

Capt. M. J. Godfrey, Lyons, Iowa:

Steamer Nick Oldham, 100 ft. by 18 ft. by 4 ft., for C. T. Oldham, Platte, South Dakota; estimated gross tonnage, 60; gasoline engine, 60 horsepower.

New-Burrell-Johnson Iron Co., Ltd., Yarmouth, N. S.:

Wooden freight and passenger steamer Ruby L. for J. A. Balcum, Margaretville; length over all, 95 ft.; approximate value, \$10,000; estimated gross tonnage, 104; compound steeple surface condensing single screw engine; one vertical boiler, 17 horsepower.

Wooden freight and passenger steamer for Three Rivers Steamship Co., Charlottetown, P. E. I.; length over all, 125 ft.; approximate value, \$35,000.

Two steel hopper barges, 105 ft. long, for the Dominion Government; approximate value, \$250,000; estimated gross tonnage, 110 each.

Wooden freight steamer for T. F. Smith & Co., Halifax, N. S.; 60 ft. long; approximate value, \$3,000; estimated gross tonnage, 25; compound steeple surface condensing single screw engine; one vertical boiler; 6 horsepower.

New York Ship Building Co., Camden, N. J.:

Twin-screw steamer, 416 ft. by 48 ft. by 30 ft.; capacity, 5,000 tons, 5,000 I. H. P.

Single-screw steamers, 285 ft. by 46 ft. by 18 ft.; capacity, 1,500 tons; 2,000 I. H. P.

Five single-screw light ships, duplicates, for the United States Government; 115 ft. by 28 ft. 6 in. by 22 ft.; capacity, 650 tons; 400 I. H. P.

J. S. Ellis & Son, Tottenville, N. Y.:

Gasoline Oyster boat "Delivery II" for the Standard Oyster Co., South Norwalk, Conn.; length over all, 56 ft.; approximate value, \$6,500; three-cylinder Hitchcock gas engine; 50 horsepower. Engine built in Bridgeport, Conn.

Twin-screw gasoline tank boat, capable of carrying 10,800 gallons of gasoline and naphtha for the Standard Oil Co., of New York; length over all, 74 ft.; approximate value, \$10,500; two three-cylinder Kamburger engines of 30 horsepower each. Engines built at 33 Sullivan St., New York City.

Gasoline fishing boat for Viggo Matzen, Brooklyn, N. Y.; length over all, 46 ft.; approximate value, \$5,000; two-cylinder gasoline engine; 25 horsepower.

Tug boat for the Newton Creek Towing Co., Long Island City, N. Y.; length over all, 74 ft.; approximate value, \$16,000; high pressure, 14 in. x 18 in.; single-screw engine.

Tug boat for the Standard Oil Co., New York; length over all, 84 ft.; approximate value, \$20,000; high pressure, 18 in. x 24 in., single screw engine.

Tug boat for Mr. W. S. Lymond and others of New York; length over all, 88 ft.; approximate value, \$22,000; high pressure, 18 in. x 24 in., single-screw engine.

Gasoline launch for E. J. Ellis, Tottenville, N. Y.; length over all, 30 ft.; approximate value, \$1,000; gasoline engine; 10 horsepower.

Kingsford Foundry & Machine Works, Oswego, N. Y.:

Two fog signal boilers for the Light-house Department.

One leg boiler for tug Interstate building for F. A. Verdon, New York.

One leg boiler for tug George C. Kirkham building for the New York Harbor Towboat Co.

One marine boiler for steamer Richmond building for Atlantic Coast & Lumber Corporation.

One marine boiler for tug Katherine building for the Lutchter & Moore Lumber Co., Orange, Texas.

One marine boiler for tug Mary McIlvaine building for Charles E. McIlvaine, Philadelphia, Pa.

One marine boiler for steamer West Seattle building for Heffernan Engine Works, Seattle, Wash.

One marine boiler for export for Ames Iron Works, New York.

Two large dredge boilers for the Coastwise Dredging Co., Norfolk, Va.

Two marine boilers for a large tug building for Lee Kimball, Mobile, Ala.

Two marine boilers for steamer Haskell, building for the Rutland Transit Co., of Ogdensburg, N. Y.

Two marine boilers for steamer Everill building for the Rutland Transit Co., of Ogdensburg, N. Y.

One marine boiler for tug McAllister Bros. building for McAllister Bros., New York.

One marine boiler for large dredge building for F. A. Needon Co., New York.

One marine boiler for tug Meta building for P. Kelly, New York.

One marine boiler for tug Laura building for Pascagonla Towing Co., Moss Point, Miss.

One marine boiler for tug Edith building for C. B. McLaury, New Brunswick, N. J.

One marine boiler for tug Claribelle building for the Jahncke Navigation Co., New Orleans, La.

One marine boiler for tug building for Robert Rogers, New York.

One marine boiler for tug Robert H. Cook building for the Lake Champlain Trans. Co.

One marine boiler for a tug building at Chicago for the Great Lakes Towing Co.

Johnson Iron Works, Ltd., New Orleans, La.:

Steel tug 75 ft. long, to cost \$5,000.

Wooden steam launch, 38 ft. long, to cost \$3,500.

Oliver Reeder & Son, Baltimore, Md.:

Open harbor lighter for M. W. Adams, Baltimore, Md.; length over all, 92 ft.; approximate value, \$3,500; estimated gross tonnage, 130.

Open harbor lighter for stock; length over all, 92 ft.; approximate value, \$3,700; estimated gross tonnage, 135.

J. T. Sharpley, Franklin City, Va.:

House boat, 30 ft. long, for W. M. Needles, Franklin City, Va.; approximate value, \$500; gasoline engine. To be used at the Jamestown exposition.

Gasoline launch for J. T. Sharpley; length over all, 18 ft.; approximate value, \$100; gasoline engine; 2 horsepower.

Small barge for J. T. Sharpley; length over all, 45 ft.; approximate value, \$250; estimated gross tonnage, 20.

Kruse & Banks, North Bend, Ore.:

Steam schooner R. D. Inman for the Loop Lumber Co., San Francisco, Cal.; length over all, 200 ft.; approximate value, \$105,000; estimated gross tonnage, 650; triple-expansion engine; one single-screw Scotch boiler; 650 horsepower. Machinery furnished by United Engineers of San Francisco.

Steam schooner S. L. Loop for Loop Lumber Co., San Francisco, Cal.; length over all, 200 ft.; approximate value, \$105,000; estimated gross tonnage, 650; triple-expansion engine; one single-screw Scotch boiler; 650 horsepower. Machinery furnished by the United Engineers of San Francisco.

Steam schooner Bandon for Estebrook Co., San Francisco, Cal.; length over all, 170 ft.; approximate value, \$85,000; estimated horsepower, 400; two triple-expansion engines; two Scotch marine boilers; 500 horsepower. Machinery being built by Chicago parties.

J. Bishop, Gloucester, Mass.:
Wooden schooner Pontiac for Capt. Enos Wickerson, Boston, Mass.; length over all, 112 ft.; approximate value, \$14,000; estimated gross tonnage, 115.

Main St. Iron Works, San Francisco, Cal.:
Single-screw compound engine, and one Scotch marine boiler, 400 horsepower, for steamer Raymond building for Sudden & Christenson, San Francisco, Cal. Hull, 187 ft. long, building in Prosper, Ore.

Stanley C. Vansant, Atlantic City, N. J.:
Auxiliary schooner smack Elizabeth C for Charles Carlson, Anglessea, N. J.; length over all, 51 ft.; approximate value, \$5,000; estimated gross tonnage, 25; 20 horsepower Lathrop gasoline engine.

Auxiliary schooner smack for Albert Anderson, Holly Beach, N. J.; length over all, 51 ft.; approximate value, \$5,000; estimated gross tonnage, 25; 20 horsepower Lathrop gasoline engine.

Auxiliary schooner Holly for Oscar Elmquist; length over all, 51; approximate value, \$5,000; estimated gross tonnage, 25; 20 horsepower Lathrop gasoline engine.

Bertelsen & Petersen, East Boston, Mass.:
Compound engine, 17-36 by 24-in., 600 horsepower, for double-screw ferry boat for Stillman Saunders, Saunderstown, R. I. Hull is building by owner.

Wm. Skinner Ship Building & Dry Dock Co., Baltimore, Md.:
Three steam steel tugs, duplicates, for the Standard Oil Co., New York City; length over all, 100 ft.; estimated gross tonnage, 200; compound, single-screw engine; one Scotch boiler; 700 horsepower.

Frederick S. Nock, East Greenwich, R. I.:

Hunting cabin gasoline launch Lenda for M. E. & E. Bliss, Providence, R. I.; length over all, 40 ft.; approximate value, \$3,500; three-cylinder Standard engine, 6 in. by 8 in. by 4 in.-stroke; 18 horsepower.

Cabin gasoline cruiser Lydia II for Zenas W. Bliss, Providence, R. I.; length over all, 36 ft.; approximate value, \$3,600; two-cylinder Chase engine, 6 by 7 in. by 4-in. stroke; 15 horsepower.

Gasoline boat for W. H. Peck, New

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York City; length over all, 40 ft.; approximate value, \$3,500; two twin-screw engines (4 stroke) each; 15 horsepower.

Gasoline boat for L. M. Pitman, Providence, R. I.; length over all, 27 ft.; approximate value, \$1,500; two-cylinder Godshalk engine; 10 horsepower.

Hunting cabin gasoline launch, 33 ft. long; approximate value, \$2,500; Globe engine; 10 horsepower.

Alex. Miller & Bro., Jersey City, N. J.:

Two fire boats, duplicates, for New York City, 132 ft. long; flush deck, hose tower, turbine centrifugal pumps; fore and aft compound turbine engine, 18 by 38 in. by 26-in. stroke; Babcock & Wilcox boiler.

James M. Bayles & Son, Port Jefferson, L. I., N. Y.:

Wooden twin-screw boat Jessemine for A. H. Morris; length over all, 90 ft.; approximate value, \$17,000; two 60 horsepower Craig motors.

George H. Miller & Co., Patchogue, L. I., N. Y.:

Centerboard auxiliary yawl, 38 ft. long, for stock; approximate value, \$2,200; estimated gross tonnage, 8; gasoline motor, 7 horse power.

Centerboard auxiliary yawl, 35 ft. long, for stock; approximate value, \$1,900; estimated gross tonnage, 6; gasoline motor; estimated horsepower, 5.

David Fenton, Manchester-by-the-Sea, Mass.:

Knockabout cruiser for Dr. Howard, Boston, Mass.; length, 44 ft.; beam, 10 ft. 6 in.; approximate value, \$4,000; designed by B. R. Crowninshield.

Gardiner G. Deering, Bath, Me.:

Four masted schooner of about 1,250 tons capacity.

Greene Bros. Co., Bridgeport, Conn.:

Oyster boat for Charles W. Bell, Rowayton, Conn.; length over all, 50 ft.; approximate value, \$6,000; estimated gross tonnage, 15; Hitchcock gas engine, 30 horsepower.

Oyster boat for Charles E. Hopkins, Longmeadow, R. I.; length over all, 50 ft.; approximate value, \$6,500; estimated gross tonnage, 15; Hitchcock gas engine; 40 horsepower.

The engines for these boats are built by the Hitchcock Gas Engine Co., Bridgeport, Conn.

Jakobson & Peterson, South Brooklyn, N. Y.:

Scow for the Phoenix Steamship Co., 17 State St., New York City; length over all, 100 ft.; approximate value, \$6,000; estimated gross tonnage, 400.

Peter Hagan & Co., Philadelphia, Pa.:

Wooden steamer Florence R., for

builders; length over all, 34 ft.; approximate value, \$2,500; estimated gross tonnage, 12; compound engine; pipe boiler.

Barge M. V. Hagan for builders; length over all, 112 ft.; approximate value, \$7,500; estimated gross tonnage 375.

Barge R. F. Hagan, for builders; length over all, 108 ft.; approximate value, \$6,000; estimated gross tonnage, 250.

Matthews Ship Building Co., Hoquiam, Wash.:

Steamer Helene for E. T. Kruse, San Francisco, Cal.; length over all, 185 ft.; approximate value, \$80,000; compound engine, 15 and 32 in. cylinder diameters by 24-in. stroke; Scotch boiler, 11 ft. by 11 ft.; 400 horsepower, Machinery Building by Williamette

Iron & Steel Works, Portland, Ore.:

Steamer Temple E. Dorr for the Pacific Lumber Co., San Francisco, Cal.; length over all, 185 ft.; approximate value, \$90,000; triple-expansion engine, 12, 19 and 32 in. cylinder diameters by 24-in. stroke; Risdon water-tube boiler; 500 horsepower.

Steamer Eddy, for the Pacific Lumber Co., San Francisco, Cal.; length over all, 204 ft.; approximate value, \$110,000.

The Moran Company, Seattle, Wash.:

Steel freighter for the Northwestern Steamship Co.; length over all, 294 ft. 8 in.; gross tonnage, 2,499; triple-expansion, single screw engines, two single ended Scotch boilers; 1,300 horsepower.

Steel steam whaler for the Barneson-Hibberd Co.; length over all, 102 ft.; gross tonnage, 1,567; compound, twin screw engine; one single-ended Scotch boiler; 350 horsepower.

Steel steam trawler for A. Booth & Co; length over all, 150 ft.; gross tonnage, 4,432; triple-expansion, single screw engine; one single-ended Scotch boiler; 600 horsepower.

Two steel freighters, duplicates, for Robert Dollar; length over all, 250 ft.; gross tonnage, 1,730; triple-expansion single screw engine; two single-ended Scotch boilers, 800 horsepower.

Steel fire and tug boat for the Southern Pacific Co.; length over all, 110 ft.; gross tonage, 255 ft. 5 in., triple-expansion, single screw engine; one Babcock & Wilcox water-tube boiler; 600 horsepower.

H. D. Bendixson Ship Building Co., Eureka, Humboldt Co., Cal.:

Steamer Hoquiam for Matthew Turner, 209 Stewart St., San Francisco, Cal.; length over all, 195 ft.; approximate value, \$80,000; estimated gross tonnage, 725.

Steamer Daisy Freeman for W. A. Mitchell Co., 136 Stewart St., San Francisco, Cal.; length over all, 195 ft.; approximate value, \$80,000; estimated gross tonnage, 725.

Steamer E. B. Hough for the Commercial Pacific Cable Co., 253 Broadway, New York; length over all, 140 ft.; approximate value, \$55,000; estimated gross tonnage, 325.

Steamer Yellowstone for Charles R. McCormick & Co., 509 Market St., San Francisco, Cal.; length over all, 210 ft.; approximate value, \$85,000; estimated gross tonnage, 775.

Steamer for M. Turner, 209 Stewart St., San Francisco, Cal.; length over all, 195 ft.; approximate value, \$80,000; estimated gross tonnage, 725.

Steamer for Holmes-Eureka Lumber Co., Eureka, Cal.; length over all, 175 ft.; approximate value, \$75,000; estimated gross tonnage, 650.

Steamer for Charles R. McCormick & Co., 509 Market St., San Francisco, Cal.; length over all, 195 ft.; approximate value, \$80,000; estimated gross tonnage, 725.

J. Lindstrum, Aberdeen, Wash.:

Wooden steam schooner Berkeley for C. H. Higgins, 210 Dunn St., San Francisco, Cal.; length over all, 180 ft.; approximate value, \$75,000; estimated gross tonnage, 514; compound engine; Scotch marine boiler; 500 horsepower.

Wooden steam schooner J. Marhofer for Olson & Mahony, Stenan and Mission streets, San Francisco, Cal.; length over all, 190 ft.; approximate value, \$85,000; estimated gross tonnage, 595; compound engine; Scotch marine boiler; 620 horsepower. Machinery building by Williamette Iron & Steel Works, Portland, Ore.

Wooden steam schooner Bee for Fred Linderman, 22 Market St., San Francisco, Cal.; length over all, 190 ft.; approximate value, \$85,000; estimated gross tonnage, 595; compound engine; Scotch marine boiler, 620 horsepower.

Wooden steam schooner Claremont for the Hall & Wood Lumber Co., 364 Berry St., San Francisco, Cal.; length over all, 200 ft.; approximate value, \$100,000; estimated gross tonnage, 620; compound engine; tubular boiler (to be built by the Risdon Iron Works, San Francisco); 700 horsepower.

Wooden steam schooner for Beadle Bros., Mission St. Wharf, San Francisco, Cal.; length over all, 190 ft.; approximate value, \$85,000; estimated gross tonnage, 595; compound engine; Scotch marine boiler; 620 horsepower Machinery building by Williamette

Iron & Steel Works, Portland, Ore.
Williamette Iron & Steel Works,
Portland, Ore.:

Single screw compound engine and one Scotch boiler for steam schooner Hele building for E. and E. T. Kruse, San Francisco, Cal. Hull building by Matthews Ship Building Co., Hoquiam, Wash.

Single screw compound engine and one Scotch marine boiler for steam schooner Harhoffer building for Olson & Mahoney, San Francisco, Cal. Hull building by J. Lindstrum, Aberdeen, Wash.

Two single screw compound engines and two Scotch marine boilers for two steam schooners building for Beadle Bros., San Francisco, Cal.

One single screw compound engine and one Scotch boiler for a steam schooner building for the Bee Steamship Co., San Francisco, Cal.

Machinery for river steamer J. N. Teal consisting of a pair of high pressure cylinders and one locomotive firebox marine boiler; 700 horsepower.

Oliver Gildersleeve & Sons, Gildersleeve, Conn.:

Two coal barges, duplicates, for the Hartford & New York Transportation Co., Hartford, Conn.; length over all, 150 ft.; approximate value, \$17,500; estimated gross tonnage, 500.

One deck lighter for Oliver Gildersleeve & Sons; length over all, 110 ft.; approximate value, \$8,000; estimated gross tonnage, 300.

N. A. Jacobs, Portland, Me.:

Steam launch, 35 ft. long, for E. L. Stanwood, Portland, Me., equipped with a Stickney engine and Roberts boiler.

American Bridge Co., Pittsburg, Pa.:

Steel coal barge for the Havana Coal Co., 308 Betz building, Philadelphia, Pa.; length over all, 90 ft.; approximate value, \$7,000.

Seven steel coal barges, duplicates, for the American Steel & Wire Co., Cleveland, O.; length over all, 100 ft.; approximate value, \$5,000 each.

I. Matheson & Co., New Glasgow, N. S.:

Two steel hopper barges, duplicates, for the department of public works of Canada; length over all, 105 ft.; width, 22 ft.; depth, 8 ft.; capacity, 200 cubic yards.

Mozena Bros., Clarington, O.:

Stern paddle wheel ferry boat for the Sisterville Ferry Co.; length, 115 ft.; engines and boilers on the ferry Orion to be installed on this new ferry, 10 in. by 4 ft. stroke.

One speed launch, 6 ft. by 40 ft.; one launch 5½ ft. by 22 ft.; and one stern paddle gasoline boat, 14 ft. by 60 ft.

Williams-Whittlesey Co., Long Island, N. Y.:

Wooden launch Dolph for W. G. Stuber; length over all, 57 ft.; Standard gasoline engine; 25 horsepower.

Wooden launch Seminole for H. T. Koerner; length over all, 55 ft.; Standard gasoline engine; 50 horsepower.

Wooden launch Decota for T. B. Pritchard; length over all, 65 ft.; Buffalo train crew gasoline engine; 2-30 horsepower.

Wooden motor yacht for A. Heckscher; length over all, 80 ft.; Standard gasoline engine; 300 horsepower.

Wooden motor yacht for A. Felix Du Pont; length over all, 75 ft.; Standard gasoline engine; 75 horsepower.

Wooden motor yacht for E. R. Thomas; length over all 85 ft.; Thomas triple screw gasoline engine; 250 horsepower.

Dubuque Boat & Engine Co., Dubuque, Iowa:

Steam steel car ferry Albatross for Louisiana & Mississippi Railroad Transfer, New Orleans, La.; length over all, 305 ft.; estimated gross tonnage, 1,100; two engines, 26 in. by 10 ft.; four Bonson boilers, 72 in. by 18 ft. Engines building by the Charles Barnes Co., Cincinnati, O.

Two hydraulic dredges for United States Government Corps of Engineers, St. Louis, Mo.; length over all, 197 ft.; estimated gross tonnage, 500; two engines, 24 in. by 8 ft.; six Mississippi river type boilers.

Eighteen pontoons, 47 ft. 6 in. long, for above dredges.

One Bonson marine boiler for tug Virginia building for the Memphis Sand & Gravel Co., Memphis, Tenn. Size of boiler, 54 in. by 14 ft.

W. A. Boole & Son, Oakland, Cal.:

Steam schooner Sibyl Marston for Sibyl Marston Co., San Francisco, Cal.; length over all, 215 ft.; estimated gross tonnage, 1,020; triple-expansion, single screw engine; two Scotch marine boilers.

Robert White Engineering Works, Brooklyn, N. Y.:

Wooden tug for A. J. Balaban, 817 Beverly Road, Brooklyn, N. Y.; length over all, 90 ft.; approximate value, \$20,000; simple H. P., single screw engine; one White patent marine boiler; 175 horsepower.

The Marine Boiler Works Co., Toledo, O., are constructing the boilers for eight steamers building by the Great Lakes Engineering Works and three steamers building by the Toledo Ship Building Co. They are also supplying the boilers for the tugs Wm. D. and America of the Great Lakes Towing Co.'s fleet.

NEW YACHT FOR CYRUS CURTIS.

Contract for building a twin-screw, steel, steam yacht has been awarded to the Gas Engine & Power Co. and Charles L. Seabury & Co., Consolidated, Morris Heights, New York city. The vessel is from the designs of Mr. Charles L. Seabury, and is for Mr. Cyrus Curtis, member of the Philadelphia, Eastern and other yacht clubs. The principal dimensions of the yacht are: 175 ft. over all, 147 ft. water line, 20 ft. beam, 12 ft. depth of hold and 8 ft. draught. A speed of 19 to 20 miles per hour has been guaranteed. The vessel is well along in construction, as shown by accompanying pictures.

The yacht will be flush deck, schooner rigged, with two-pole masts. The deck house forward will be constructed with steel coaming and steel posts. The lower part to be paneled both inside and outside, with mahogany, and the upper part fitted with plate glass drop windows. Ceiling to be paneled with mahogany, and the upper part fitted with plate glass drop windows. Ceiling to be paneled with mahogany. The forward part of deck house to be fitted as dining saloon, with buffet at after end. Aft of the dining room, and connecting with same, steward's pantry will be arranged. Dumb waiter will be fitted from galley to pantry. Aft of the steward's pantry on the port side, the captain's room will be arranged. This will also be used as a chart room, and a locker, table, etc., for that purpose. same will be provided with berth to fold, also wash basin, etc. Aft of the pantry on the starboard side, toilet room for use of owner and guests will be arranged, same to have entrance from the main deck.

A large bridge will be arranged on the top of the forward deck house. The officer's bridge will be at the forward end, provided with marine telegraphs for signaling engineer, steering wheel, compass, binnacle, speaking tubes to engine room, etc. The after deck house will be constructed substantially the same as the forward house. This will be used as social hall or music room. The bulwarks to be constructed of steel, surmounted with teak rails. The inside of bulwarks to be paneled with mahogany. All skylights, companion-ways, hatches etc., to be of mahogany.

Below decks forward, starting at the bow, chain locker will be constructed, followed by the boatswain's locker and lamp room, aft of which the crew's toilet will be fitted. The fore-

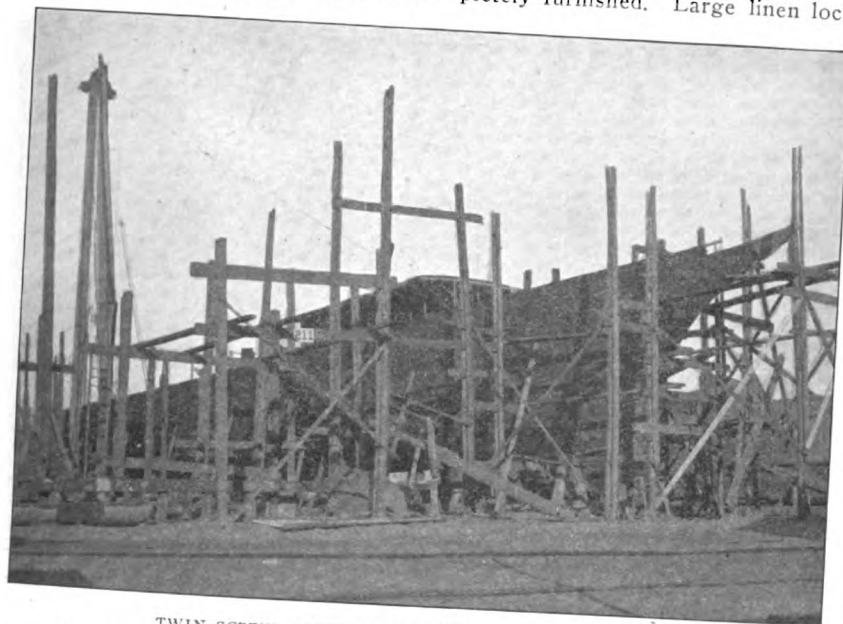
castle, arranged with thirteen pipe berths, will be provided. The officer's quarters will follow the forecastle, with three large staterooms. Officer's mess and toilet will also be arranged. Next aft, the galley is provided, full width of the vessel, complete with all modern conveniences. A large stor-

Aft of these rooms, and opening from after end of main saloon, will be two large staterooms, with brass bedstead in each, and arranged with sliding door, same as in the owner's staterooms. Following the two staterooms for guests, is a large bath room, completely furnished. Large linen lockers

GASOLINE MOTOR SCHOONER NORTHLAND.

The average New Yorker haunting the vicinity of the North river becomes so accustomed to seeing all that is biggest and best in the shipping world, that it is only the appearance of some extraordinarily-built vessel can arouse in him more than a passing interest. There arrived in New York on Dec. 14, the latest type of sea-going craft—the gasoline motor freight schooner Northland, belonging to the Northern Paper Co. The Northland, hailing from Rockland, Me., where she was built by the Cobb-Butler Co., is a wooden-hulled vessel of 2,047 gross tons, 246 ft. in length, beam 44 ft. 6 in., depth of hold 26 ft. 6 in., and is the largest motor schooner in the world. Her auxiliary propelling apparatus consists of a six-cylinder double-acting Standard motor of 500 H.P., driving a wheel 7 ft. diameter and 4-ft. pitch, the engine room being large and roomy and located in the stern of the vessel. At the sides of the engine room are the two gasoline tanks, with a capacity of 6,000 gallons.

She is lighted throughout by electricity, the power being supplied by two gasoline-driven dynamos. The cargo is raised to the deck by electric elevators, thereby dispensing with the usual winches and derricks on the deck. The platform of the elevator acts as hatch cover when not in use. In the forward engine room is installed the windlass and steam winch, wrecking pumps and donkey boiler, built

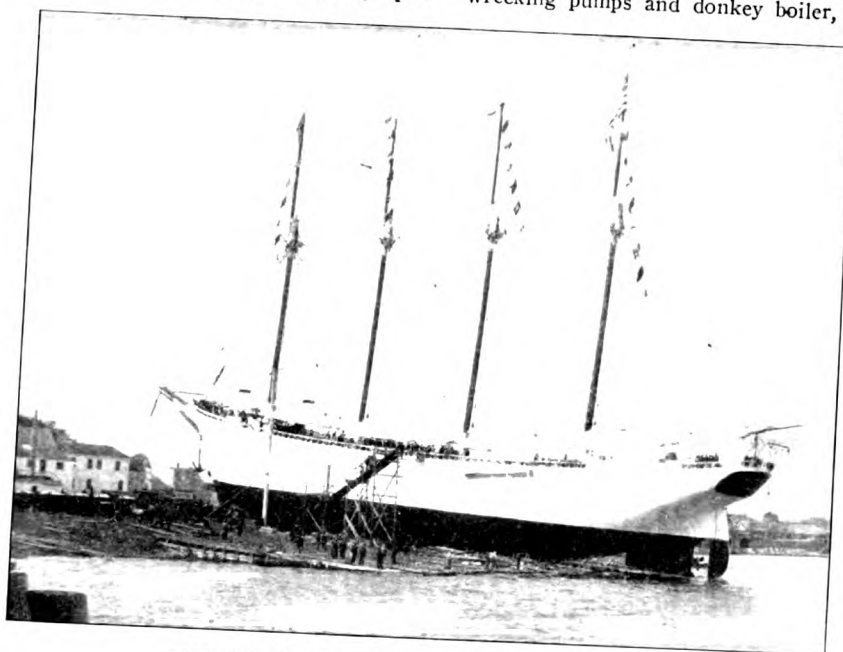


TWIN-SCREW STEEL YACHT FOR CYRUS CURTIS
Building by Gas Engine & Power Co. and Charles L. Seabury & Co., consolidated,
Morris Heights, N. Y.

age for extra ice supply will be arranged under the galley floor. The machinery compartment follows the galley. This will be provided with two Seabury triple-expansion marine engines, each with cylinders 11 in., 16½ in. and 26 in. diameter by 12-in. stroke. Steam will be supplied by two Seabury patent safety water-tube boilers of the latest design. Aft of the machinery compartment, the owner's bath room will be arranged, provided with large bath tub, marble wash basin, patent marine water closet, and all the necessary toilet fixtures. All of the plumbing to be of the open pattern. The bulkhead between bath room and engine room to be arranged, so as to eliminate the passage of sound and heat. Aft of the bath room, and connecting with same, will be arranged the owner's staterooms, two in number, side by side. Sliding door arranged between these rooms, having full length mirrors on each side. Brass bedstead, dressing case, upholstered divan and other conveniences arranged in each room. The saloon is next aft of the owner's staterooms, extending part of the width of the vessel, fitted with upholstered transom seat. On the starboard side, opposite main saloon, will be arranged one stateroom, for use of guests, fitted with single bed. Aft of this stateroom, will be fitted a lavatory and toilet room, with entrance from the saloon.

and other closets will be provided. Lazarette is aft, with entrance from main deck.

Light and ventilation throughout the vessel has been very carefully pro-



GASOLINE MOTOR FREIGHT SCHOONER NORTHLAND.

vided for. The yacht will be lighted throughout with electricity, and heated with steam. Naphtha launch and full equipment of small boats will be carried in the davits. The delivery of the vessel will be made to the owner, May 1, 1907.

by the Hyde Windlass Co., of Bath, Me. Unlike the usual order of things, considerable attention has been given to the accommodation of the crew, from the captain to the cabin boy, the ship being fitted out to the point of luxuriousness. The captain's room is finished off in syc-

more, the furniture being of polished oak. He also has an innovation in the shape of a roll-top desk. In the officers' rooms the fittings are much the same, Morris chairs, also of polished oak, being a noticeable feature. The finish of the main cabin, companions, and pantries, is superior to many of the private yachts afloat.

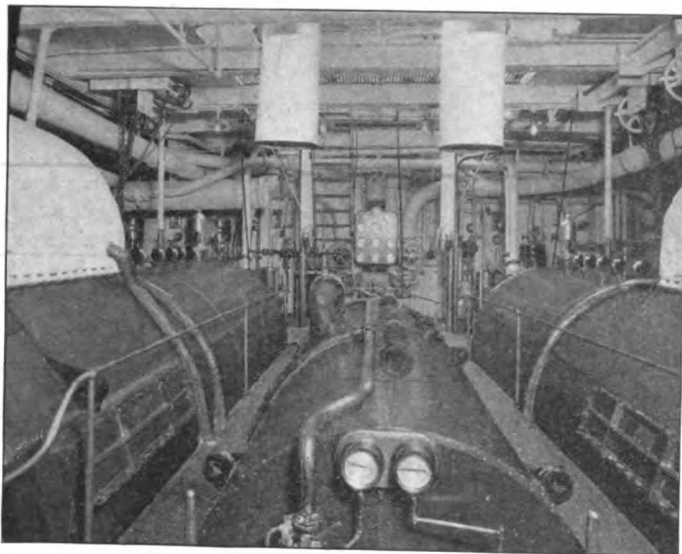
TURBINE STEAMER GOVERNOR COBB.

The Governor Cobb, the first turbine-propelled steamer equipped with Parsons turbines to be built in this country, is now in regular service between Boston and St. Johns, New Brunswick, for the Eastern Steamship Co. She was con-

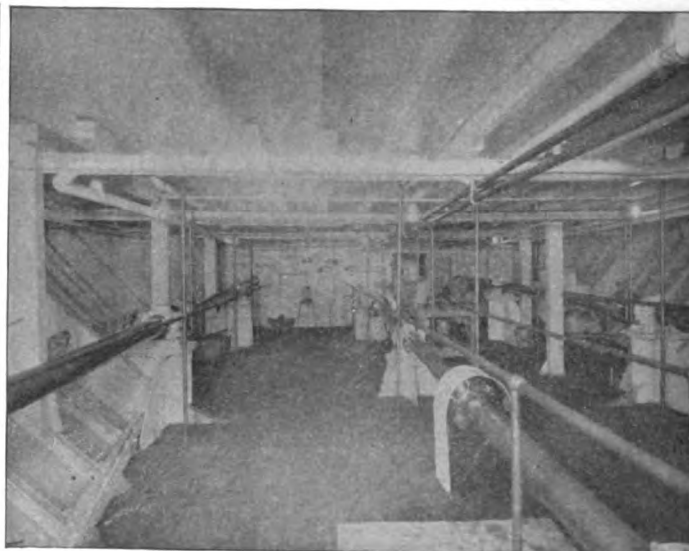
eral athwartship water-tight bulkheads.

She has four decks, i. e., main, saloon, gallery and boat, her dining room being on the main deck aft.

Her passenger accommodation consists of 175 state rooms and berths, every consideration being shown in the fittings and finish to make the voyage comfortable.



ENGINE ROOM STEAMER GOVERNOR COBB LOOKING FORWARD SHOWING TURBINES.



AFTER PART OF ENGINE ROOM, STEAMER GOVERNOR COBB, SHOWING SHAFTS.

The Northland carries thirteen of a crew—all told—and will run between New York and the coast of Maine.

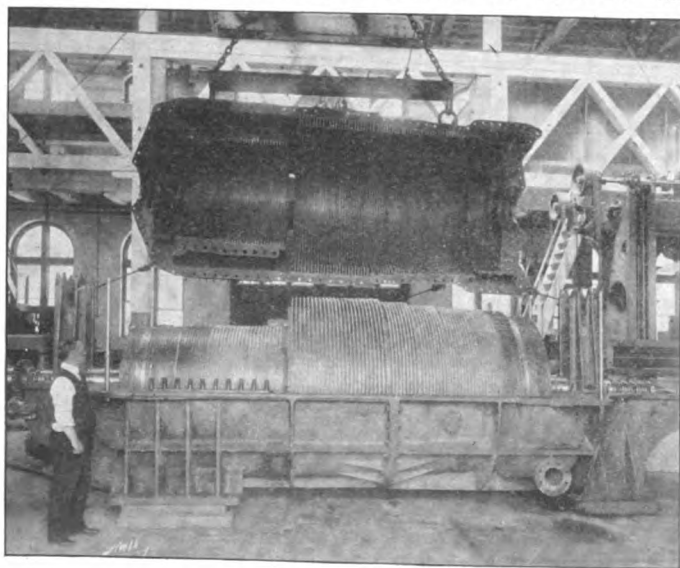
REPAIR WORK.

McIntyre & Henderson, Baltimore, Md., have completed repairs on the Norwegian steamer Bod and are now at work on the British steamer Brookline, putting her through a No. 3 survey, and

traced for by the W. & A. Fletcher Co., of Hoboken, N. J., the builders of her turbine machinery and boilers, who sublet the construction of the hull to the Delaware River Iron Shipbuilding & Engine Works, of Chester, Pa.—Roach's yard.

Her length on the water line is 290 ft., whilst overall she measures 300 ft. She has a molded beam, on the water line of

Her propelling machinery consists of three Parsons turbines, driving three propellers, the amidship turbine getting high-pressure steam, the two outboard turbines low-pressure. The amid-ship propeller is an "ahead" propeller only, the outboard turbines being constructed to run ahead or astern as occasion requires. In the latter case, the center turbine is stopped pro tem, each engine being inde-



VIEW OF TURBINE IN SHOP, UPPER HALF OF CASING SUSPENDED IN AIR.



MACHINE SHOP OF THE W. & A. FLETCHER CO., HOBOKEN, N. J. WHERE THE COBB'S MACHINERY WAS BUILT.

expect to complete her about the middle of January. This company is also building a boiler and engine for stock and contemplate building a hull for same in the near future.

51 ft., her beam over guards being 55 ft. She draws 14 ft. loaded, her depth being 20 ft. 6 in. The hull is constructed of steel, a double-bottom running the entire length of the ship, and she has sev-

pendent of the others, the low-pressure turbines having their own complete equipment of condensers, pumps, etc.

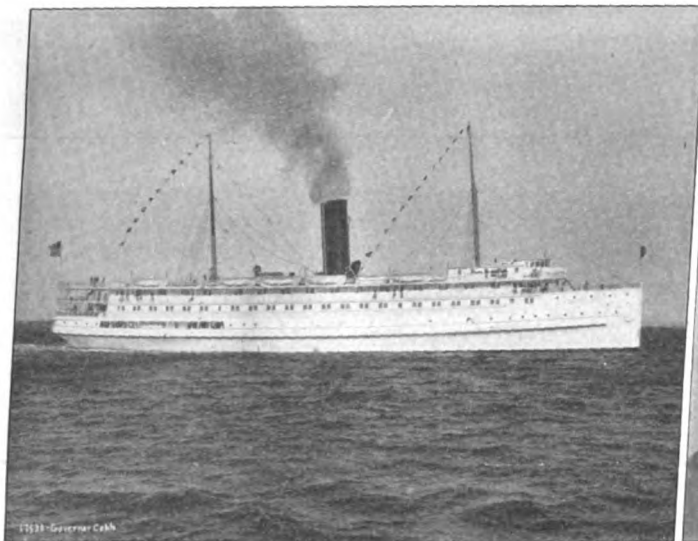
The pumps are of the well-known Blake construction.

She has six Scotch boilers for regular use carrying a working pressure of 150 lbs. per sq. in., the boilers being placed athwartships in one fore and aft boiler-room, and one donkey boiler. Though the guaranteed speed was only 17 knots, the Governor Cobb steamed on her trial trip an easy 19 knots, and showed herself

electric fittings being supplied by James B. McCoy & Sons. Her steam steering gear is supplied by Williamson Bros. Co., of Philadelphia.

The Fletcher Co. is also building two other turbine vessels, one of which is in the yard, the other having just been launched. These are the Yale and Har-

The frames are spaced 12 in. of 4 by 6 in. white oak, the planking and ceiling of 2-in. white oak and the deck of 2-in. hard pine, making unusually strong construction. Her cabin arrangements are ample, giving an engine room 11 by 12 ft. and 6 ft. high, with small stateroom aft of pilot-house. Power is supplied by



TURBINE STEAMER GOVERNOR COBB.



PASSENGER QUARTERS, TURBINE STEAMER GOVERNOR COBB.

capable of even more than that, if driven. She is fitted out with Fletcher's system of forced draft, but is constructed to steam either natural or forced. On her run from Executive Light, Long Island Sound, to Boston Light to go into commission she made the splendid average of 18.46 knots per hour, in a running time of 14 hrs. 25 min. She indicates 5,000 horsepower.

Among the other mechanical devices

ward, which will run between New York and Boston, for the Metropolitan Steam Ship Co.

They are over 400 ft. long, with 10,000 indicated horsepower, and will average 20 knots.

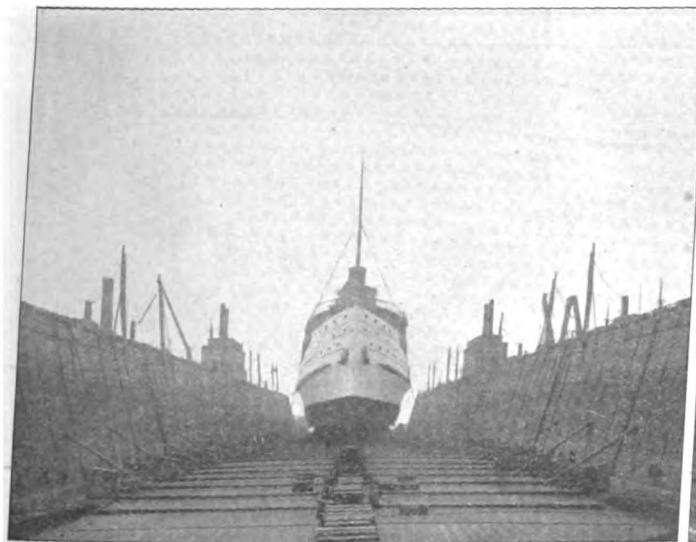
OYSTER DREDGER.

Evan Owen, Weems, Va., is building a type of oyster dredger which is becoming quite popular owing to its economy

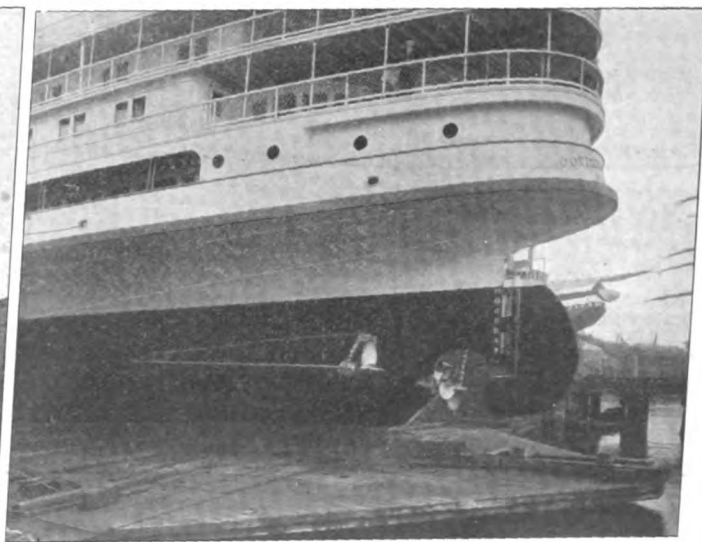
a gasoline engine of about 30 H. P. The engine is controlled from the pilot-house and the boat can readily be operated by one man.

INVADING PACIFIC TRADE.

There is every present indication that Japanese steamship owners are planning to still further invade the Pacific carrying trade. The steamer Edin Maru is now on the way to



TURBINE STEAMER GOVERNOR COBB IN DRY DOCK.



STERN VIEW TURBINE STEAMER GOVERNOR COBB, SHOWING SCREWS.

with which the ship is equipped are ash ejectors of the latest type and mechanical telegraphs built by Chas. Cory & Sons.

The ship is lit throughout by two 20 K. W. Sturtevant electric plants, the

of operation. This dredger is 50 ft. long, 14 ft. beam and 3½ ft. draught. The keel is sweet gum with a white oak keelson, the frames and planking of white oak, deck beams and cabin of hard pine.

Seattle, followed by the Yanata Maru, bringing sulphur and general merchandise, and will carry back wheat to the home port. The Fukui Maru is coming to San Francisco

THE MARIE GILBERT.

The Gilbert Transportation Co., of Mystic, Conn., have just put into commission the new auxiliary motor freight schooner Marie Gilbert for the lumber trade, sailing between Mystic, Conn., and southern ports. She was

SAN FRANCISCO'S DOCK ACCOMMODATIONS.

The California State Harbor Commission has very recently made an examination and report on the water front of the port of San Francisco, which affords an adequate idea of the

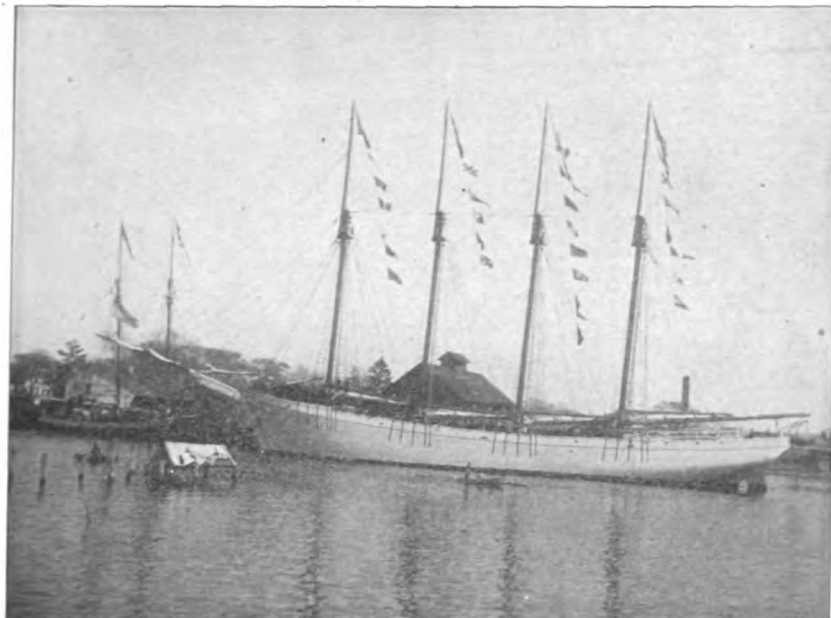
what is known as Channel Creek, also has a frontage of $1\frac{1}{4}$ miles, making a total water front of $4\frac{3}{4}$ miles now in use for commercial purposes.

The total number of miles of wharf is $3\frac{3}{4}$, exclusive of the bulkheads. There are 10 piers, each 800 ft. long, 24 piers each 600 ft. long, eight large passenger ferry slips, and four car ferry slips.

The present piers will accommodate over 200 vessels, at an average of 250 ft. to each vessel. The great fire destroyed 2,200 ft. of berth room, of which 1,200 ft. has already been built. In addition, San Francisco has available for new docks the famous China Basin frontage. This immense fill was made by the Santa Fe Railway system at a cost of nearly \$3,000,000. Nearly 60 acres are included in the colossal fill, and three years were required to complete the task. The China Basin frontage is 3,050 feet, affording great berth accommodations, on 15 bulkheads berths each 200 feet long. Besides this, the city has also 4,400 feet of sea wall available.

Already the latter is partly constructed. A portion of Islais Creek, a large tidal inlet can be improved for a reasonable sum, thus giving 4,000 more feet of navigable water way on which docks may be built.

San Francisco certainly has for her resources the making of one of the



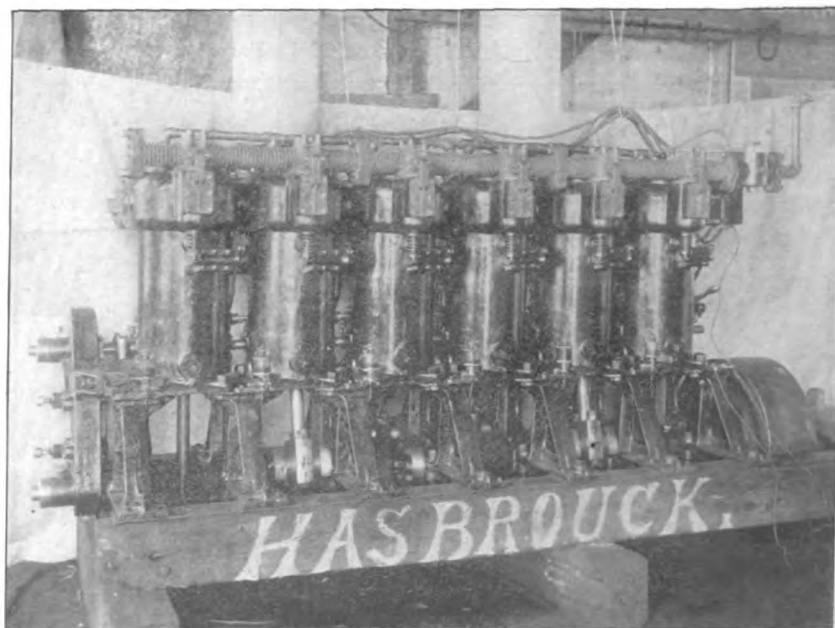
GASOLINE FREIGHT SCHOONER MARIE GILBERT.

built in their own yard at Mystic, and represents the latest type of merchant schooner. The Marie Gilbert is 170 ft. in length; 38 ft. beam; 11 ft. 6 in. deep, of 700 gross tons, and is four-masted. Her auxiliary propelling apparatus consists of a six cylinder gasoline engine of 150 H. P., built by the Hasbrouck Motor Co., of New London, Conn., and weighs 6,000 lbs., driving a propeller 4 ft. 6 in. in diameter at an average speed of from 300 to 350 revolutions per minute.

The motor has cylinders 9 in. in diameter, with 13 in. stroke, jump spark ignition, and air starting, the compression being relieved before starting. The valves are of the mechanical inlet and outlet interchangeable type.

The engine is 4 ft. 6 in. in height from center of crank shaft, and is 12 ft. long over reversing gear, the reversing gear being of the builders own design. She is equipped with a governor to prevent racing when out of gear. The hoisting engine, placed on the forward deck, is of 16 H. P., also built by the Hasbrouck company. She is lighted throughout by electricity, installed by the Richardson Engineering Co., of Hartford, Conn., and is also equipped with a storage battery.

extent and importance of the commercial facilities and shipping accommodations of the harbor. The water front of San Francisco has frontage extend-



HASBROUCK GASOLINE ENGINE IN SCHOONER MARIE GILBERT.

ing from Fishermen's Wharf, on North Beach, clear around to Central Basin, a distance of $3\frac{1}{2}$ miles; and

best and largest dock accommodating ports in the world. The water front loss sustained by the earthquake was \$7,000,000.

SENECA CHAIN CO.

The Seneca Chain Co. recently increased its capital stock from \$100,000 to \$200,000, which increase was necessitated by their rapidly growing business. They have entirely remodeled their plant at Kent, O., equipping same for the manufacture of dredges, steam shovels, hoisting and marine chains of all sizes. They have also purchased the plant known as the American Chain Co.'s plant at Zanesville, O., which they now have in full operation. This gives them an output at both plants of 227 fires, employing at the Kent plant 400 hands and at Zanesville 70 hands and have equipped both plants with the most modern machinery for chain making.

This company has secured a contract from the government for all of the chains for light vessels for the different ports for the year 1907, a contract amounting to approximately \$40,000. The specifications for this chain are the severest that are written on either chain or iron, requiring an iron averaging from 48,000 lbs. to 52,000 lbs. tensile, 30 per cent elongation, 60 per cent elastic limit and 40 per cent contraction of area and the requirements of the chain being in proportion to that of the iron, the inspection being exceedingly close and careful, as very much depends upon all these chains in the way of loss of life and property, so that these are among the highest grade chains which are made in the world today.

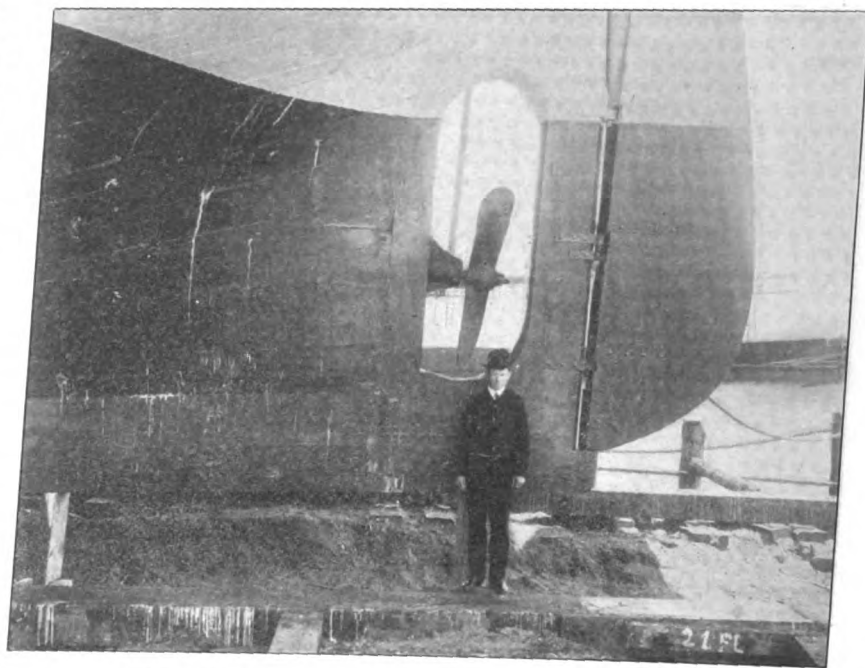
They are also making some heavy ca-

for the Edison Engineering Co. of New York City of $3\frac{1}{4}$ -in. iron, which will be the heaviest chain ever made in the United States. Each link of this will weigh over 100 lbs., and the hooks 457 lbs. each.

The Seneca Chain Co. is now in a po-

COMPETENCY OF SEA-GOING ENGINES.

Editor MARINE REVIEW: I notice in December Engineers' Number mention of a new bill to regulate the certificates of competency of sea-going engineers under the British Board of Trade rules.



RUDDER AND SCREW OF GASOLINE SCHOONER MARIE GILBERT.

sition to furnish any and all kinds of welded chains from the smallest to the heaviest ship cables and have a strictly up-to-date, modern shop in every respect.

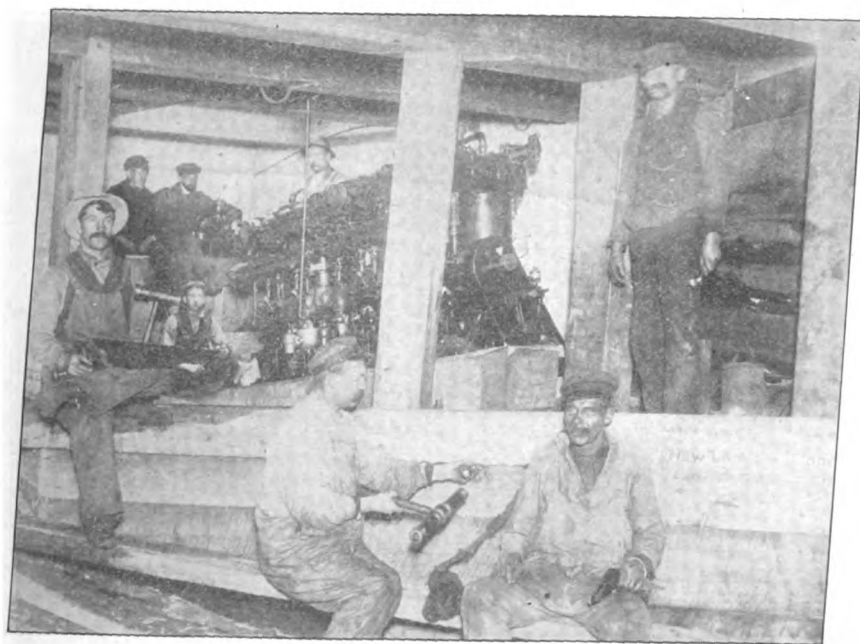
This is a step in the right direction.

No man should be in charge of a set of engines who is *not* capable of passing a creditable examination on the construction and handling of, at least his type of engines, and have a good general knowledge of marine engines and boilers.

If the "engineman" of a small coaster has served two years in the fire room, and two years as greaser or donkeyman, he ought to be quite efficient in this respect. Of course, holding the license may not make him any the better man, but it will increase his self-respect, and may make him a trifle more attentive when he knows he has something to lose besides his job.

As to the latter part of the bill—I have always understood that "engineers who contribute to breakdown at sea" *do* "have their certificates dealt with as severely as are those of deck officers, under corresponding circumstances" although I have never known personally, any engineer who was held responsible for a breakdown, and had his license revoked or suspended.

New York, Dec. 23. "BOOTLE."



BUILDING THE GASOLINE ENGINE IN THE SCHOONER MARIE GILBERT.

bles for the Newport News Ship Building & Dry Dock Co. of $2\frac{1}{4}$ in. and 2 3-16-in. iron, and a chain for a very large crane

Their advertisement appears on another page of this issue showing a cut of their plant.

I. L. Snow & Co., Rockland, Me., are building for themselves a coaster to be 125 ft. long, $34\frac{1}{2}$ ft. beam and 9 ft. depth of hold.

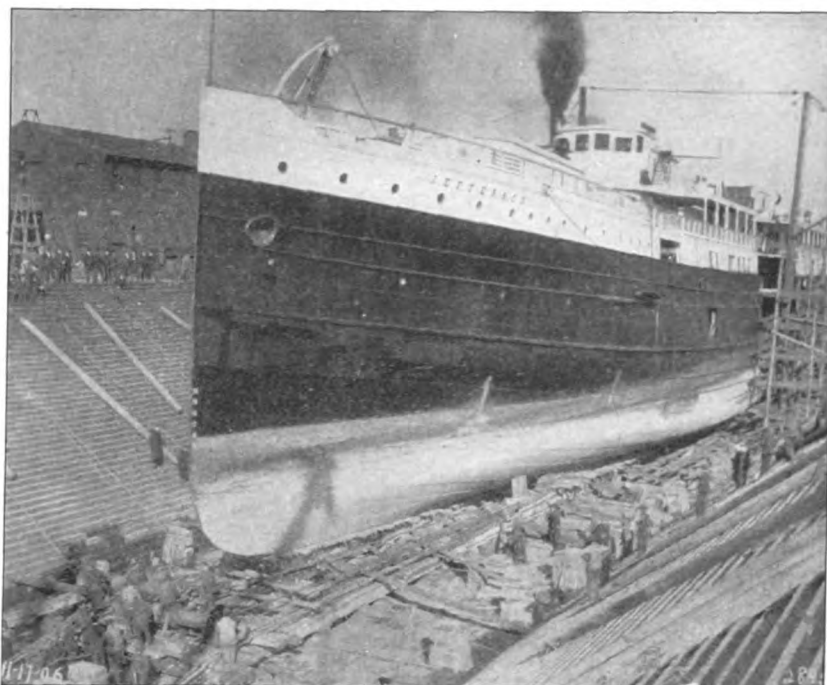
LENGTHENING STEAMER JEFFERSON.

A feature of the work performed by the Newport News Ship Building & Dry Dock Co., Newport News, Va., last year was the lengthening of

the cross tie a shore was fitted on each side to clips bolted on the stem, the object of these shores being to prevent movement of the sliding ways without a corresponding movement of the vessel. To support the end of the vessel under the forefoot a 14-in. sliding way was used under the keel. The tackle consisted of two sets of four-fold seven-inch Manila purchase on each side fastened to the ends of the sliding ways and to the bottom of the dock. Two 35-H. P. electric winches were fastened to the ground ways to support the necessary power and two 100-ton hydraulic jacks were provided to help the start. The pull was directly on the sliding ways, the sections separating readily, the forward end being pulled the required distance without a hitch.

The Roberts Safety Water Tube Boiler Co., will shortly ship one of their boilers to the Leland Stanford Jr., University of California. This boiler is to be a part of the equipment of the Chemistry Laboratory. This makes the tenth Roberts boiler used by colleges, of which Yale, Harvard, Cornell and University of Pennsylvania use them in their coaching launches of the "Varsity" crews.

The American Steam Packing Co. has moved to 51 High street, Boston.



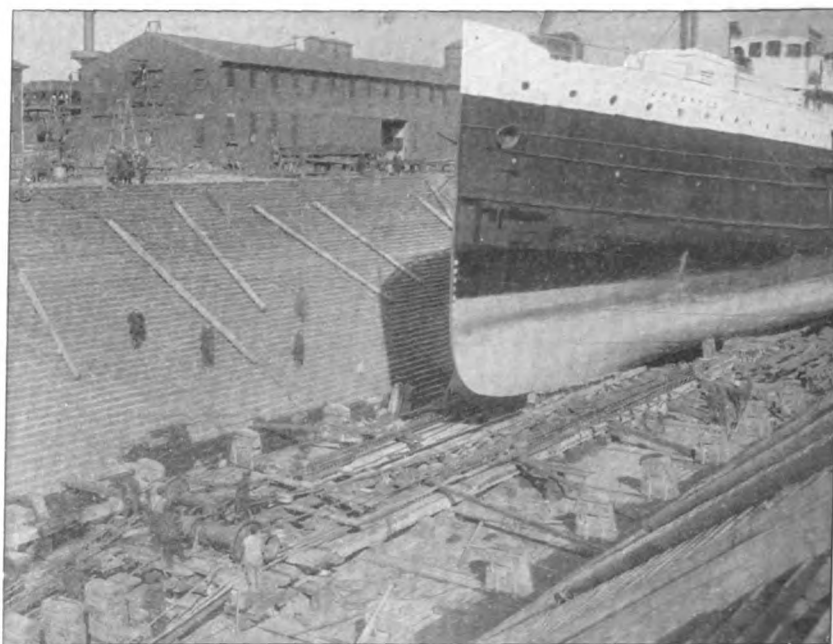
PULLING THE OLD DOMINION LINER JEFFERSON APART IN THE DRY DOCK OF THE NEWPORT NEWS SHIP BUILDING & DRY DOCK CO., NEWPORT NEWS, VA.

steamers. The steamers Hamilton and Jefferson, of the Old Dominion line, were lengthened 46 ft. The steamer Essex, of the Merchants & Miners Transportation Co.'s fleet, was lengthened 36 ft. and the pilot boat Relief was lengthened 12 ft. The steamer Essex was burned to the water's edge at her pier in Baltimore and all of the deck houses were made entirely new while the steamer was being lengthened. The dining saloon and passenger accommodations were moved from the main deck to the house on hurricane deck and the main deck space was devoted to cargo. The cargo space under the lengthened arrangement has been increased about 27 per cent and an additional cross bunker added. The lengthened steamer is 296 ft. long.

The pilot boat Relief was lengthened 12 ft. and a new cross bunker added. The pilot house was raised to the top of the deck house and other changes made in the arrangement of the quarters.

The Jefferson was cut in two at the after boiler room bulkhead. The boilers, up-takes and stack were removed from the ship prior to pulling her apart. A set of sliding and groundways was placed in the dock and the vessel floated into the desired position over the ways after which the dock

lar launching ways. They were supported about 21 inches from the bottom of the dock and were about 19 ft.



SHOWING TACKLE USED IN PULLING OLD DOMINION LINER JEFFERSON APART IN THE NEWPORT NEWS DRY DOCK.

apart on the outboard sides. The sliding ways were 26 by 14 in. and at their outer ends were fastened together and shores placed between the cross ties and clips bolted on the shell. From

Mr. Charles S. Keep, formerly secretary of the Lake Carriers' Association, will be appointed state superintendent of banks of the state of New York.

"In The Merchant Service."

When Johnson arrived aboard he seemed annoyed to see us in possession of his room, or it may have been only the number of us that annoyed him. At any rate, the fact remained that he didn't look pleasantly surprised as he removed his wet coat, (it was a

pened on, and it was the only box the man had, sold out so quickly, in fact."

When he pulled off the wrapping paper and laid the box admiringly on the table we leaned forward to get a closer view.

"Fancy looking box, all right," commented Smith, "but you can't judge a

decipher the floral decorations on the band.

He lit and smoked in silence, till the cabin was filled with the delicate aroma of the bargain cigars, when Chalmers recollected that he had some letters to write which must be attended to right away. He stepped through the door into his own cabin and a second later we distinctly heard the soft metallic thump of a cigar entering a brass spittoon. Smith's cigar hung fire; mine, with a last faint salt-petery sputter had gone out, but Johnson smoked on.

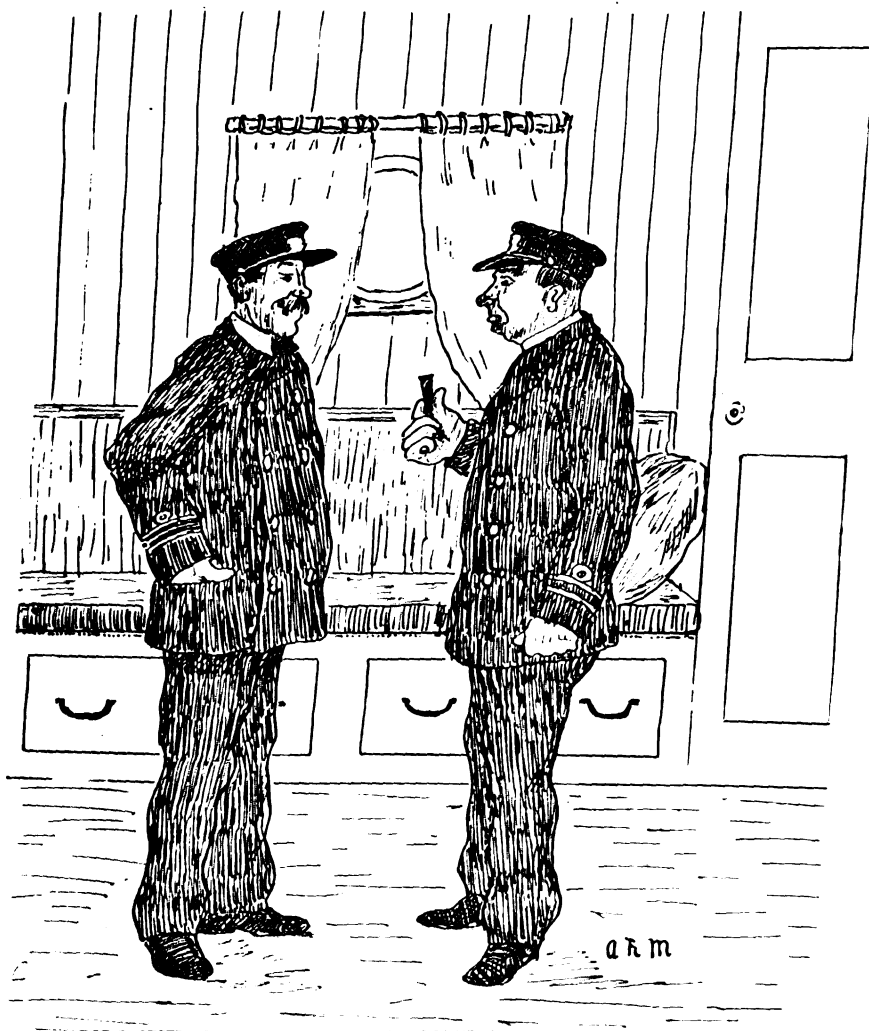
"You fellows don't seem to like these smokes," he said, eyeing us dubiously, "perhaps they are a trifle green, but you'll soon get to like them that way—I do."

But we didn't intend to, though some kinds of vegetables are preferable in that state, cabbage, now, should be boiled or pickled.

We hated to break the news to Johnson, so went out on deck where the evening breezes could play around us. If we had smoked these cigars coming into port we would have been held up at quarantine and disinfected.

That night the second mate confided to his chief that the third engineer had got the drop on him, by getting him to accept and smoke a punk-odored weed which nearly killed him. No doubt these engineers were getting some more of their humor passed off.

Next morning the carpenter fixed a panel in the door of Johnson's room and was rewarded for his services with one of the cigars, which he could smoke after breakfast. After breakfast saw him sitting on the hatch outside of his room, the port and door of which was open, and his electric fan was humming around. He was waiting for the atmosphere to clear—at his feet lay two thirds of a cigar. About this time Johnson began to get suspicious of the falling off of the cigar habit along the quarters. Nobody seemed to want to smoke, even if he left his desk, where the cigars were kept, unlocked. He even went the length of leaving the box around in the most reckless manner, which in itself was suspicious. He was too thrifty to throw them away and giving them away was not only difficult but dangerous—he was a small man. One evening—oh joy—he found a handful—a whole handful—had been taken. Well, someone had found a use for



THE SECOND MATE CONFIDED TO HIS CHIEF.

drizzling wet night), and placed a package which had been concealed under it, on his bunk.

The ever-inquisitive Smith, sitting on the edge of the bunk, tapped the parcel with his knuckles and said "Cigars!" We exchanged surprised grins—the idea of the thrifty Johnson buying tobacco amused us, and we understood now why he had refrained from giving us the glad smile when he clambered aboard with his hords.

"Yes," admitted Johnson, as he proceeded very deliberately to undo the cord that bound his treasure, "I struck a bargain at a little cigar store I hap-

man by the coat he wears." "Nor yet a sausage by its skin," added the facetious Chalmers.

"Pass the box around and let us sit in judgment on the bargain," I said. "though I know Johnson to be a connoisseur in matters of that kind."

This sarcasm was lost on Johnson but it acted as an incentive to his passing the cigars around; he acquired his knowledge as a judge by sampling the brands of his acquaintances.

"Smoke up," he remarked encouragingly to Smith who was squeezing a cigar between his thumb and finger, sniffing at it critically, and trying to

them, and a load was gradually lifting from his mind. But next morning they had been thrown back into the box—minus one—and the chief's "tiger" served breakfast wearing a woe-be-gone look.

In the evening some of Smith's friends called on board. Conversation was flowing merrily along when Johnson suddenly asked if the visitors smoked, a gleam of hope rising over his horizon. Then he had to follow the silently beckoning form of Smith to the door and the visitors heard Smith say in a hoarse whisper, "Rush out these blessed cauliflowers of yours and I'll knock your block off—you understand?" which, to say the least, was extremely rude.

That night, when the lights were low, and all was calm and peaceful, the port in Johnson's room was cautiously opened—a box of cigars struck the surface of the water with a slight splash and started off down the river. From the port an anxious face with a gradually increasing expression of relief, watched it drift far, far out towards the fathomless deep.

When I came on Carson he was leaning against the boiler-room door on deck, his hands in his pockets and a look of deep disgust on his face.

It was the day before sailing, and the crew had knocked off for the afternoon, so I was surprised to see him still in his dongarees; he was famed for the lightning-like rapidity with which he could wash, dress, and get ashore, after the bell had rung in the engine room.

We had been lying in Liverpool for a week, and next day would see us swinging down the river, outward bound.

"Well, Carson," I remarked, with my usual misguided playfulness, "has your girl gone back on you, money run out, or your shore-going duds in pawn again, that I find you hanging around aboardship looking so damned cheerful?"

"Cheerful, is it?" he responded gloomily, "I must say I feel cheerful, and so would you if you were in my shoes."

"What is the trouble then," I inquired in a soothing tone, "anything I can help you out on?"

"Well, now, I'll just tell you all about it hoping that you won't let any of the other fellows know, for they'd kid the life out of me."

"To start at the beginning, I'll have to tell you that I had a couple of hundred good cigars to go ashore this week, duty free, and I had formed a

committee of ways and means (of myself) to decide the best way of managing it, and keeping the cigars out of sight of the customs' sharks till the time was ripe and I could walk off with them.

"Well, after considerable thinking, I took a third of them down the engine room to that old hand pump we never use, and, when nobody was around, I took the cover off of the pump and placed the cigars inside the chamber. Then I put the cover on again, and a more innocent looking pump you never saw when I was through.

"The next instalment I took up the shaft tunnel and stowed them away inside some of the spare condenser tubes. The cigars were just a nice sliding fit in the tubes, and I put about a dozen in each tube, placing the tubes so that I could just put my hand on them when wanted, and congratulating myself that the tube idea was a master-stroke.

"The remainder of my stock I carried down into the boiler-room, and after some searching and climbing found a nice corner on a stringer plate where the dust had gathered an inch thick. There I placed my cigars, far from prying eyes, after having wrapped the lot in an old piece of cloth.

"Now, between you and me, don't you think that was a smart piece of work?"

I nodded encouragingly, but as Carson still stared despondingly about him, ventured to say, "Well?"

"Well—no it wasn't well—and I'll tell you why. Last night when we had all knocked off, I took a monkey wrench down the engine room, as it was time to get some of my cargo ashore, and took the cover off of the pump again. Now, you know as well as I do, that we never use that pump, at least I never saw it used. I reached down into the chamber and pulled out well, they were once cigars—but some blame fool had been monkeying with the pump, and got some water in to the chamber. You can fancy what the cigars were like—before I put them into the donkey boiler furnace.

"The old pump having gone back on me, I thought it high time to see if the cigars in the tubes were all right so hurried off up the tunnel.

"I saw at the first glance that the tubes had been shifted, some one having borrowed one of the pieces of scantling on which they rested, turning the tubes all over in wrestling with the timber. Well, there was a nice job for me, trying to pick my half dozen tubes from that bundle, but

it had to be done and quickly too—if I wanted to get my stuff ashore that night.

"When I picked the first tube up and tried to look into it, I found that the length of it caused it to sag heavily in the center, and no matter how I held it I couldn't get it straight enough to see through it. The only light in the tunnel was the lamp fixed to the roof, the candles were locked in the store, and a hand lamp would make too much smoke, so I was meeting trouble on every side.

"I found a piece of wire in the engine room and with it commenced fishing in the ends of the tubes, as I had pushed the cigars well home out of sight, and now saw where I had given myself some extra work.

"At last I came on one of my tubes and felt better—for a time—till I found on canting the tube end up and shaking it, that the cigars did not drop out. "Then the horrible truth dawned on me that the damp air of the tunnel had swelled the cigars which were a close fit to start with, till they were firmly jammed in the tubes. The long rod that you engineers use when putting in new tubes, was lying handy and I tried to push the cigars out with it, managing, after some trouble, to punch out a bunch of damp cigar leaves.

"They were all the same, every blessed one of them; so much for another third of my two hundred.

"This afternoon, when everything was quiet, I thought I'd slip down into the fireroom and bring away the bundle I had stored down there, flattering myself that away up on the stringer plate they were safe from any dampness or monkeying.

"On the way into the boiler room I met the donkey-man with a hose and he told me that the engineer had had the men give the fire-room a bit of a washdown. I don't think I need to tell you any more. They had given the fire-room a washdown—for once in their lives—and paid particular attention to corners on stringer plates.

"Up on that particular stringer there are a lot of fir-cone-shaped masses of tobacco pulp—my cigars—lying scattered about.

"Wouldn't that make you weep?"

There are times when the heart is full, the weary soul aches and cannot be comforted, and one wishes to be alone in one's anguish. I stole softly away, congratulating myself that Carson in his despondency had overlooked the fact that it was customary on his part, to brace me, on such afternoons for the price of a drink.

THE "STAND-BY" MAN.

SEEN AND HEARD IN THE ENGINE ROOM.

Two captains of steam schooners entered a shipping office. By a "steam schooner," it should be mentioned, is meant one on board of which the heavy work, such as pumping, hoisting sails, heaving anchors, etc., can be done by steam machinery. Remember, not an auxiliary vessel.

The first captain, there, wished to hire a second mate who also could perform the duties of an engineer. The other captain required a first class engineer who would consent to also act as second mate.

Apparently both captains understood that very few men, if any, could have had an opportunity to become proficient in both vocations.

The first captain, deeming the deck-work of most importance, desired to hire a "mate-engineer;" the other captain asked for an "engineer-mate."

While piously hoping that both captains may have found that of which they were in quest, marine engineers, those without special training as deck-officers, have a rather poor opinion of the man who offers his services as both engineer and mate, or, mate and engineer, at the captain's option. The difference in the condition of the machinery on board a schooner carrying an "engineer" and that on board of which one member of the crew's title is hyphenated, leads one to suspect that in the latter case the vessel owner has adopted the penny-wise and pound foolish policy.

And the above is the candid opinion variously expressed all along the coast—of the cognoscenti.

A genius has been defined as "an individual who does an unusual thing at the right time."

But for a genius who offered his services in both afore mentioned capacities there would not be much time available in which to do many things—unusual or otherwise.

"Because mate and engineers do not so generally 'lie around loose,'" said the observant boarding house runner "they are seldom shanghaied like sailors and firemen." But one case is on record of a marine engineer being drugged, beaten into submission, and finally transported to a Baltimore oyster dredger—virtually a slave.

It has been stated that there are sufficient laws on the statute books, the only trouble being the failure to enforce them.

In the instance of the marine engineer, however, the legislators seemed to have failed to enact a law applicable to the case.

A warrant was sworn out for kid-

napping—but the man never having been held for ransom the charge could not be pressed.

The next step was to swear out a warrant under the law for the regulation of employment agencies.

For one reason and another, for instance, owing to the difficulty of securing witnesses, the prosecution of the case has been postponed—at any rate, nobody is likely to be punished for enslaving the engineer. But said engineer has suffered, unintentionally, it is true, that good might be done.

In short, on June 28, 1906, President Roosevelt approved the "anti-shanghai bill."

Mr. T. B. Johnson, a New York lawyer, was the principal speaker before the merchant marine and fisheries committee of the house of representatives, and it is due to him, and those who were associated with him in this movement, that when in the near future an engineer, or any one is "lying around loose," prospective shanghaiers are likely to deem the new law a powerful deterrent. Shanghaiing used to be a farce, a pleasantry, at most a misdemeanor. But—nous avous charge tout cela; now the law defines it as a crime, professional shanghaiers notwithstanding. Moral—"For all that, don't lie around loose," for quoting Mr. T. B. Johnson: "It is not expected that this legislation will abolish shanghaiing any more than capital punishment has done away with murder; but it is bound to have a great deterrent effect and with energetic co-operation on the part of the prosecuting attorneys a great step in advance will have been made for the protection of the American sailor."

The engines of an ocean-going steamship are always well taken care of. They represent a large capital which is not directly returning interest—and the stockholders are not in business for their health. Some parts tastefully painted, others brightly polished, the engines convincingly testify to the engineers' success in their anti-rust crusade.

But those neglected steam winches on the deck. Unceasingly hard worked while in port, insufficiently protected while at sea, the lot of the winches is similar to the traditional one of the transgressor—hard.

Longshoremen generally "drive" these winches.

"I shove this car away from me, turn the little wheel—and, she heaves," explained an engineer-longshoreman.

A moment later she refused to heave, the correct manipulation of car and little wheel notwithstanding.

"Boss, she's busted," and an engineer, a real one, had to be summoned to doc-

tor the step-motherly-treated auxiliary. While at sea an engineer stuffs some packing in places where it is most urgently needed; (and this has to be done during the engineer's watch below); then a deck-hand daubs some paint on the most prominent parts, and the winch is declared fit for the duty expected of it while in port.

Are there any perfectly conditioned, non-rattling steam winches? Certainly—on the decks of newly-launched steamers.

A regular contributor to a western marine publication, a certain F. B., always heads his articles: "Vote for the Referendum and the Recall." This contributor to the MARINE REVIEW—(a publication which is trying to reeve more mast-head halyards for American flags)—intends to quote, at the end of his stories, some authentic news item, each time demonstrative of the deplorable fact of American capital being invested in a foreign craft.

News item:—

"Capt. Willis, of the British bark Melanhope, his wife and two daughters and eighteen of a crew were picked up at sea by the schooner William H. Smith."

Also—The Melanhope is a British bark of 1,564 tons, rated an A-1, iron ship and owned by Moore & Co., of San Francisco (an American city on the Pacific coast).

Enough said.

F. H.

GOULD'S NAUTICAL SCHOOL.

Among those who are studying at Gould's nautical school this winter are the following: C. Morrison, of Wayne, Mich., who wheeled on the Coffinberry; Bertrand Vroman, of Put-in-Bay, who wheeled on the Orundell; Geo. B. McDonald, of Southampton, Ont., wheelsman on the H. B. Nye; Louis W. Nortman, of Cleveland, wheelsman on the R. W. England; N. J. Krohn, of Elkton, Mich., wheelsman on the F. C. Ball; Conrad Christiansen, of Milwaukee, wheelsman on the McDougall, and Frank Joyner, of Alexandria Bay, wheelsman of the W. S. Mack.

No announcements have yet been made as to the 1907 appointments, but from reports now going the rounds it seems likely that a dozen or more bright young mates are lined up for captain's berths on the boats already in commission. The boats which will come out later in the season, will result in further shifts.

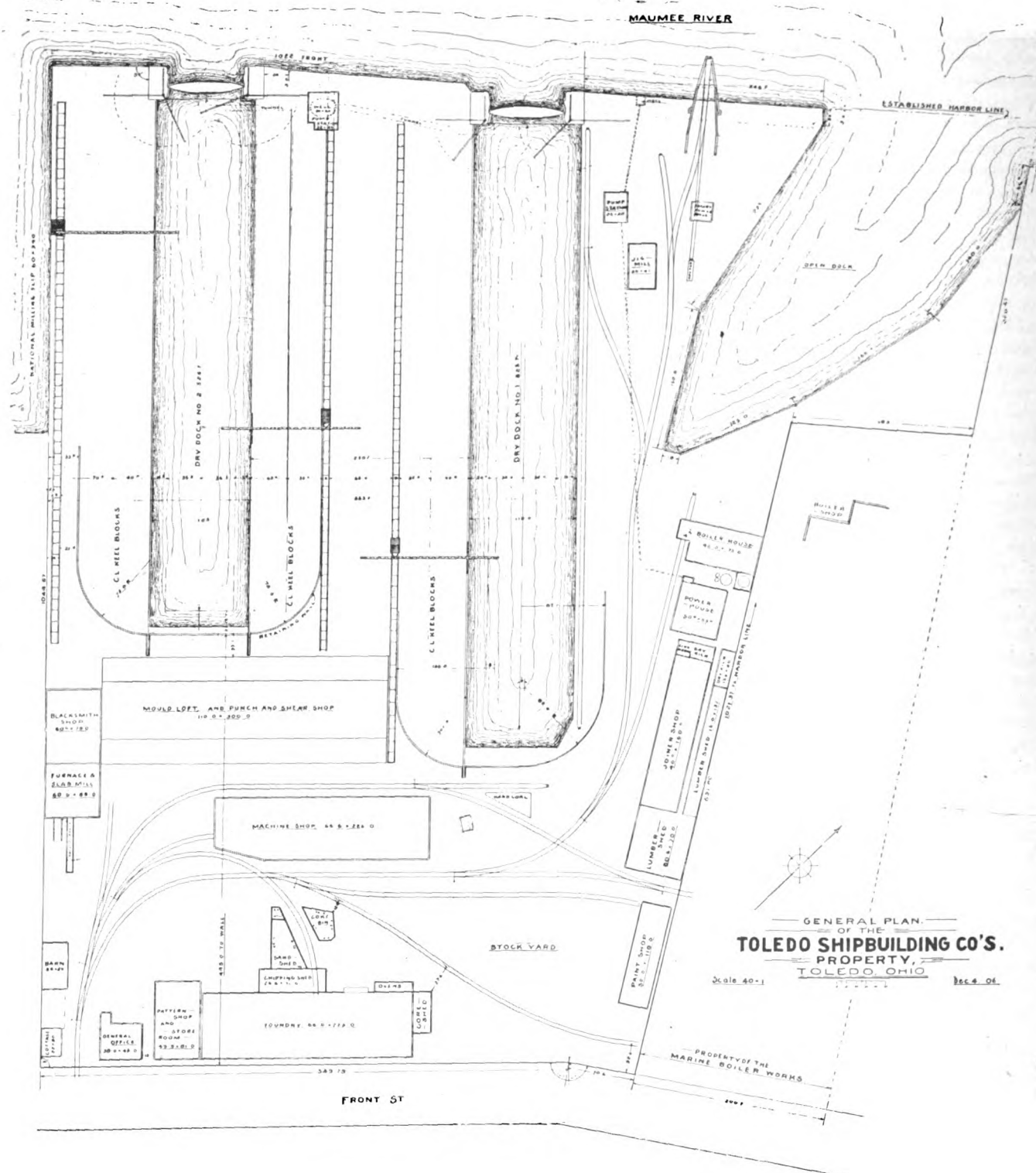
Capt. Hagen, of the steamer Samuel Mitchell, laid her up below the Main street bridge some time ago and returned for the winter to his home at Marine City.

Toledo Ship Building Company.

There is published herewith the general diagram of the Toledo Ship Building Co.'s plant as remodeled by the company. A glance at it will reveal the perfection of its arrangement for

understand the thoroughness with which the work has actually been done. The new dry dock built by the Great Lakes Dredge & Dock Co. will be ready to go into commission in

of the yard, is being built at the head of the dock, making an ideal place from which to witness launches. This dock is designed to accommodate any ship up to 550 ft. in length, the gate



handling material. Every part of the yard is commanded by electric and locomotive cranes and material can be handled with the utmost convenience, facility and economy. A visit to the plant, however, is really necessary to

about six weeks. It will be 600 ft. long, 105 ft. wide at the top, 72 ft. width of blocks and 80 ft. width of gate. The portal is massive, being of solid concrete and steel. A wall of concrete, elevated by the natural grade

being made sufficiently wide to dock passenger boats without removing guards. Vessels will be launched into this dock from the two berths, one on either side. The berth to the right is 110 ft. wide, capable of accommodat-

ing the beamiest of passenger boats.

A pumping station built entirely of concrete has been erected at the foot of the dry dock, connected by a tunnel with the old dry dock also, so that it can fill and empty both of them. The old dry dock will be enlarged to 650 ft. in length, 110 ft. wide on top, 72 ft. wide on blocks, with an 80-ft. gate. The new dry dock is commanded by electric traveling cranes, while a locomotive crane of ten tons capacity and of 50-ft. reach has been installed to the left of the old dry dock, to handle heavy weights on repair jobs.

The new power house, built of reinforced concrete, is a revelation in the way of power houses. A Murphy automatic smokeless furnace, built by the Murphy Iron Works, of Detroit, is installed in this house. This power house is smokeless not only in name but in fact. The chimney is 110 ft. high but no smoke can be seen emerging from it. The coal used is ordinary slack screenings of the cheapest kind. It is dumped directly from the railway cars into the basement from which it is elevated into hoppers and fed automatically into the furnaces. These hoppers have a capacity for 400 tons of coal and are usually kept well filled. Stoking is done by a little engine, there being only one man employed in the boiler room. The economy of this arrangement is said to be considerable. All water passes through a softening and filtering plant before it enters the boilers. Data obtained shows that 12 lbs. of water is evaporated on one pound of slack.

A four-story concrete building has been erected adjoining the office building, the first floor being utilized as a stock room, the second as a pattern shop and the two upper floors for general storage purposes. Much thought is exhibited in the design of the stock room for its various uses. Rivets are filed according to sizes and all supplies for the ship are kept absolutely in individual boxes. By this arrangement it is not only possible to put one's hand upon the article needed immediately, but a mere glance at the room keeps the general manager constantly posted as to the amount of stock on hand. This systematic method of keeping stock is carried on throughout the entire yard. Ship plates are not thrown down and piled one on top of the other, but are kept vertical overlapping one another, the number and size of each one being plainly in sight at all times.

A new punch shop and mold loft will be erected at the head of the new dry dock and will be most advantageously located for the delivery of ma-

terial to the dock and building berths. Every department has been thoroughly equipped with new machinery of the latest kind, the Cleveland Car & Crane Co. supplying a new electric crane, the Hilles & Jones Co., Wilmington, Del., a massive machine for cutting angles, the Lenox Machine Co., Marshallton, Ia., rotary shears, the Berlin Machine Works, Beloit, Wis., a sawing machine, and the J. A. Fay Co., Cincinnati, a sandpapering machine.

The Toledo Ship Building Co. has scarcely been in existence one year, but its stock is already upon a seven per cent basis. It has delivered one steamer to Mr. G. A. Tomlinson, of Duluth, and has three others under order. Its real strength, however, is in its capacity for repair work. This fact is appreciated by vessel owners as its dry dock has been practically in continuous operation during the entire year, it frequently occurring that one vessel was floated in the same day that another was floated out. In fact, with the exception of one lapse of fourteen days, the dock has not been idle for more than two days at a time during the entire year. The company has the following steamers now lying in its slips waiting for repairs to be made upon them: W. H. Gilbert, new bow and stem; Isaac L. Ellwood, repairs to bottom from grounding at Detour; Harvard, extensive repairs to bottom, twenty plates to come off, from grounding in St. Mary's river; H. S. Wilkinson, repairs to bottom; Carrington, repairs to bottom; Yuma, bottom damaged; Robert Holland, engine repairs and new shaft needed; Samuel J. Murphy, repairs to upper works; J. J. Albright, general overhauling, including six new plates; Victory, general overhauling; Sahara, general repairs; Tyrone, general repairs.

PITTSBURG STEAMSHIP CO.'S APPOINTMENTS.

President Harry Coulby, of the Pittsburgh Steamship Co., called the meeting of his captains to order at the Colonial hotel Wednesday at 10 a. m. According to previous custom, two sessions will be held daily, ending with a banquet Friday night. Among those who attended were Capt. Dennis Sullivan, of Chicago; Capt. J. W. Westcott, of Detroit, and Mr. H. W. Brown, of Duluth. The names of the steamer captain's appointments were given out on Wednesday as follows:

Steamers Morgan, A. P. Chambers, master; Ream, A. C. Chapman, master; Rogers, James Leisk, master; Widener, John Lowe, master; Corey, F. A. Bailey, master; Frick, Neil Campbell,

master; Gary, Richard Jollie, master; Perkins, W. H. Moodey, master; Edensborn, C. Geggenheimer, master; Ellwood, C. H. Cummings, master; Gates, J. A. Walsh, master; Hill, Fred Hoffman, master; Poe, W. C. Iler, master; Morse, E. O. Whitney, master; Houghton, John J. Parke, master; Cornell, W. H. Kilby, master; Harvard, A. R. Robinson, master; Princeton, John Burns; Rennselaer, S. C. Allen, master; Malietoa, R. F. Humble, master; Bunsen, Andrew Hansen, master; Van Hise, F. C. Watson, master; Murphy, A. J. Talbot, master; Shaw, H. Culp, master; Mataafa, H. J. Regan; Manna-loa, J. La Framboise, master; Superior City, F. J. Crowley; Black, M. A. Boyce, master; McDougall, John Nahrstedt, master; Fairbairn, C. J. Grant, master; Fulton, C. G. Ennes, master; Bessemer, W. S. Hoag, master; Siemens, M. K. Chamberlain, master; Coralina, W. H. Campau, master; Stephenson, H. G. Harbottle, master; Watt, W. J. Hunt, master; Crescent City, Frank Rice, master; Cole, J. W. Morgan, master; Lynch, E. W. Smith, master; Baker, Geo. Bell, master; Phipps, W. B. MacGregor, master; Empire City, James Burr, master; Maricopa, C. A. Weitzman, master; Ericsson, John Noble, master; Linn, Geo. Bankers, master; Queen City, A. C. Smith, master; Zenith City, H. Gegoux, master; Eads, A. Montague, master; Rockefeller, A. G. McLeod, master; Maritana, Geo. Bowen, master; Mariposa, C. D. Secord, master; Gilbert, A. W. Burrows, master; Cort, John A. Ferguson, master; Neilson, T. J. Cullen, master; Briton, Geo. Holdridge, master; German, J. C. Bell, master; Roman, Geo. Randolph, master; Saxon, Geo. Ames, master; Corona, John Gemmel, master; Corsica, W. E. Stover, master; Manola, F. E. Meeker, master; Mariska, A. R. Thompson, master; Maruba, C. S. son, master; Matao, Thos. Wilson, master; Marina, A. E. Bartell, master; Masaba, E. L. Sawyer, master; Palmer, Geo. Reece, master; Wolvin, Dan McGilvray, master; Colgate, John McGarry, master; Mather, Geo. Burt, master; Trevor, H. Walper, master; Cambria, W. P. McElroy, master; Griffin, W. F. Hornig, master; Joliet, W. J. Storey, master; La Salle, W. E. Warner, master; Wawatam, H. T. Kelley, master.

The names of the barge captains will not be given out for several days.

The steamer Tecumseh, owned by McArthur Bros., Ltd., Detroit, Mich., will undergo a general repairing necessitated on account of getting on shore on Lake Erie.



DEVOTED TO EVERYTHING AND EVERY
INTEREST CONNECTED OR ASSOCIATED
WITH MARINE MATTERS ON THE
FACE OF THE EARTH.

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January 3, 1907.

PRESIDENT ROOSEVELT'S TASK.

In his special message to congress on the subject of American shipping, President Roosevelt has before him a most delicate task. The semi-official statement to the effect that such a message is to be sent to the congress indicated that it would be in behalf of the Merchant Marine Commission bill which passed the senate on Feb. 14, last. The message, therefore, would be aimed, if not addressed, directly at the house of representatives. In that body there has developed a hostility to shipping legislation that is inexplicable. This the president must overcome, and succeed in convincing a majority of the members of the desirability of the passage of that measure. That the president's message will make converts, goes without saying; but

whether it will make enough converts to overcome the hostility now existing, is another question.

While the president's task, therefore, is a delicate, it should not be a difficult, one. He has, and he thoroughly understands, the facts in the case; these are unanswerable. They show that, during a half century of marvelous national development, our shipping in the foreign trade has declined to but one third of what it was, and this while our commerce has increased five-fold in value; that the protection that has been applied to all other of our national industries that are subject to foreign competition, and which explains their marvelous growth, has been denied to our ships that are in competition with foreign ships; free trade competition on the ocean has failed, while protection on the land has succeeded; that our ships upon the seas are just as much entitled to protection as are our land industries—indeed, more so, since the ships and the men are an essential element of the national defense.

President Roosevelt's message will be directed to a body that is overwhelmingly republican, the conventions of which party have, over and over again, promised legislation for the upbuilding of our oversea marine. The only measure to accomplish that purpose before the house of representatives, framed by republicans, is that which passed the senate last February.

If a republican house of representatives, with a majority of 112, can not be induced to redeem its pledges to American shipping, what hope is there that republicans can ever be induced to enact shipping legislation? If the pending ship subsidy bill fails, how may we expect another to pass?

LAKE CARRIERS' ASSOCIATION.

The annual meeting of the Lake Carriers' Association will be held in Detroit next week and will be one of the most important meetings that the association has held. There are many things of weight to be considered by the association. Last year contracts were made for two years with some of the labor unions and for one year with others, but there has been much dis-

satisfaction over the manner in which some of these contracts have been carried out. The question of advisability of entering into further contract with these unions will be brought up, and it is therefore quite important that all members be present.

It is also clear that additional aids to navigation are needed on the lakes. Probably the stranding of the Corey on Gull island in November, 1905, and the stranding of the Ireland on the same spot this fall, could have been obviated had the Michigan island light been located on the easterly end of the island, together with fog signal. At a meeting of vessel masters in Duluth about six weeks ago it was unanimously voted that this light be so located. This point is a crucial one and it would be well to have it definitely defined in all weather. In this connection it would be well to consider the establishment of submarine signaling.

Another matter of importance is the removal of the aids to navigation by the government before the season of navigation ends. It is bad enough for vessels to contend with foul weather in the fall months without the government making their navigation doubly difficult by the removal of lights. Yet every season the last trips have to be run with all lights out. Probably the wreck of the steamer Nicol and the stranding of the steamer Waldo could have been prevented had the customary lights been burning. Lake navigation has grown prodigiously, over 50,000,000 tons having been moved on Lake Superior alone last year. It is a commerce of vital significance to the entire country, because upon it depends the welfare of all the industries having to do with iron. The saving to the country by reason of the cheapness with which this enormous tonnage is moved more than repays annually the amount expended by the government upon lake channels since their improvement began; and it is certainly absurd to submit vessel owners and insurance companies to the risk of losing millions merely that the federal government may save a few pennies. Aids to navigation should be continued until the

last boat is in, and provision could then be made for the removal of the caretakers.

There are many things of great moment to be discussed at the annual meeting of the Lake Carriers' Association next week, and it is important that every member should attend.

42-in. stroke, supplied with steam from two Scotch boilers, 13 ft. 9 in. in diameter and 11½ ft. long. The Garretson will carry approximately 10,000 gross tons of ore. Mr. Russel C. Wetmore, vice president of the ship building company, did the honors at the launching with Mr. Frank Jeffrey, of Detroit. Among the guests who attended from Cleveland were General

spectors of steamboats was invited to witness.

Further developments may result in establishing this system on board of steamers to give warning of an approaching steamer in thick weather, greatly reducing danger of collision.

Should, however, this method of signaling, together with the various aids to navigation, such as additional light-house, gas buoys, stakes and all other forms of reducing hazard on the lakes

emergency gear is becoming popular on the lakes and is being installed on a number of new steamers. Mr. Robert Logan, general manager, represented the ship building company at the launching, which was attended by a large party from Buffalo and Tonawanda. The two sister steamers, the Leland S. DeGraef and the W. M. Mills, are building at the Lorain yard.

The American Ship Building Co., launched at its Bay City yard on Saturday last, the freighter General Garretson, building for the Gilchrist Transportation Co., of Cleveland. The new steamer was christened by Miss Margaret Garretson, of Cleveland, in honor of her father. The Garretson is 540 ft. over all, 520 ft. keel, 54 ft. beam and 31 ft. deep. She has sixteen hatches spaced 24 ft. centers. Her engines are triple-expansion with cylinders 22½, 56 and 60 in. diameters by

or from locating the device which the sound proceeds. The device consists of a bell suspended under water at the desired point and to be sounded by an electric or any appliance that is reliable and effective. The receiver on board ship consists of a water-tight metal box about one foot square securely fastened to the inner side of the planking or plating of the ship below the water line (preferably in the after part of the vessel.

This box is filled with water in which is suspended a small metallic bulb to which a wire is attached and extended to the pilot house and connected to a receiver very similar to a telephone receiver.

This crude description is as I remember its arrangement from witnessing an exhibition of the device on the Potomac river two years ago—which exhibition the board of supervising in-

stalled in them and several that are now building will be supplied with these floors.

The Cleveland & Buffalo Transit Co. has authorized its general manager, Mr. T. F. Newman, to obtain complete plans and specifications for a new steamer to have a stateroom capacity equal to the City of Erie and City of Buffalo combined. Such a boat would be the largest passenger steamer on the lakes. Mr. Newman will take the matter up with Mr. Frank E. Kirby who has designed nearly all of the side-wheel steamers on the lakes and it is expected that the general plans will be ready to submit to ship builders early during the present year, the steamer to come out during 1908. When the new steamer is put on Erie will be made a port of call.

New Steamer J. H. Sheadle.

In response to numerous requests, both in this country and from abroad, the MARINE REVIEW endeavors in this issue to give a complete description of a modern lake bulk freighter pictorially and technically. For this purpose the steamer J. H. Sheadle built

is nigh well perfect, and as the accompanying diagram shows, is practically equally divided between guests' and crew's quarters. The obligations of the trade are such that these freighters must occasionally

addition to the deadlights, and electric fans, ventilators of the salt water type are carried down into the passenger quarters from the texas deck. These staterooms are models of the

type of the modern ore carrier and embodies moreover some advanced ideas for the comfort of the crew. An inspection of this steamer will reveal scores of minor touches that are the outcome of individual experience and extreme thoughtfulness. Doubtless these are due to the practical knowledge of the marine department and the sympathetic appreciation of the management which is ever alert to promote the well being of the crew. These features will be discussed before the general description of the steamer is entered into.

To begin with, there is a return to the old style of having the deck-houses flush with the deck. The superiority of living above the deck rather than below it are too apparent for discussion. The arrangement of the deck-house forward or forecastle

ters, and on the port side the crew's quarters. The texas above contains the captain's office and bedroom with a stairway leading directly from the bed room into the pilot-house.

The quarters for the guests consist of a parlor, two staterooms each with one double lower and one single upper berth, and a bathroom. The parlor is finished in dark oak and lighted from the ceiling and sides by handsome electric fixtures. It contains a built-in desk and bookcase of oak harmonizing with the general design of woodwork. The furnishings of the room are simple and of excellent taste, but the photographs describe this better than words. Telephonic communication is provided direct to the galley. Unusual precautions have been taken to insure a fine circulation of air, for in

in the luxury of reading after retiring. Standard Pullman blankets are provided for the berths with the initials C. C. I. Co. worked in them.

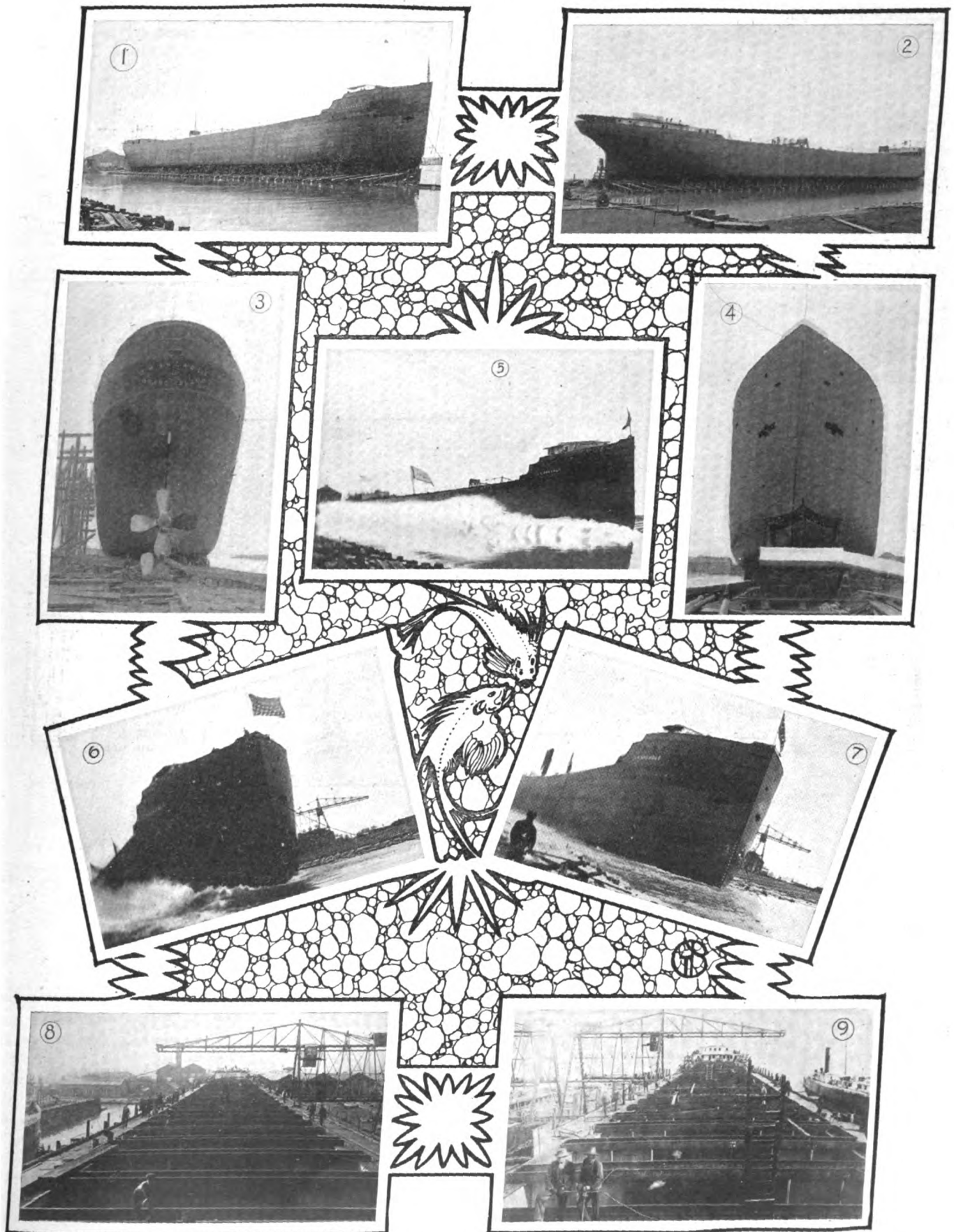
In visiting the crew's quarters the first thing that impresses the observer is the sitting-room, comfortably furnished with tables and chairs, and a library of about one hundred volumes. The selection of books varies from fiction to the standard books on navigation. This feature is greatly appreciated by the crew. It is certainly a new departure on the lakes for an owner to install a library on vessels for the entertainment and instruction of the crew, and is probably unknown on the ocean as well. Records of the books called for are kept and it is gratifying to note that they are constantly in demand.

The mate's room contains a built-in bookcase and desk and two berths

LAUNCHING VIEWS OF STEAMER, J. H. SHEADLE

e.

ghts, and electri-
e salt water type
to the passenger
a texas deck
ure models of



1. STEAMER J. H. SHEADLE READY FOR HER DIP IN THE WATER LOOKING AFT. 2. STEAMER J. H. SHEADLE READY FOR HER DIP IN THE WATER, LOOKING FORWARD. 3. STERN VIEW, STEAMER J. H. SHEADLE. 4. BOW VIEW, STEAMER J. H. SHEADLE. 5. STEAMER J. H. SHEADLE LEAVING THE LAUNCHING WAYS. 6. STEAMER J. H. SHEADLE JUST AFTER STRIKING THE WATER. 7. STEAMER J. H. SHEADLE COMING TO AN EVEN KEEL AFTER LAUNCHING. 8. STEAMER J. H. SHEADLE DECK VIEW, LOOKING AFT. 9. STEAMER J. H. SHEADLE DECK VIEW, LOOKING FORWARD.

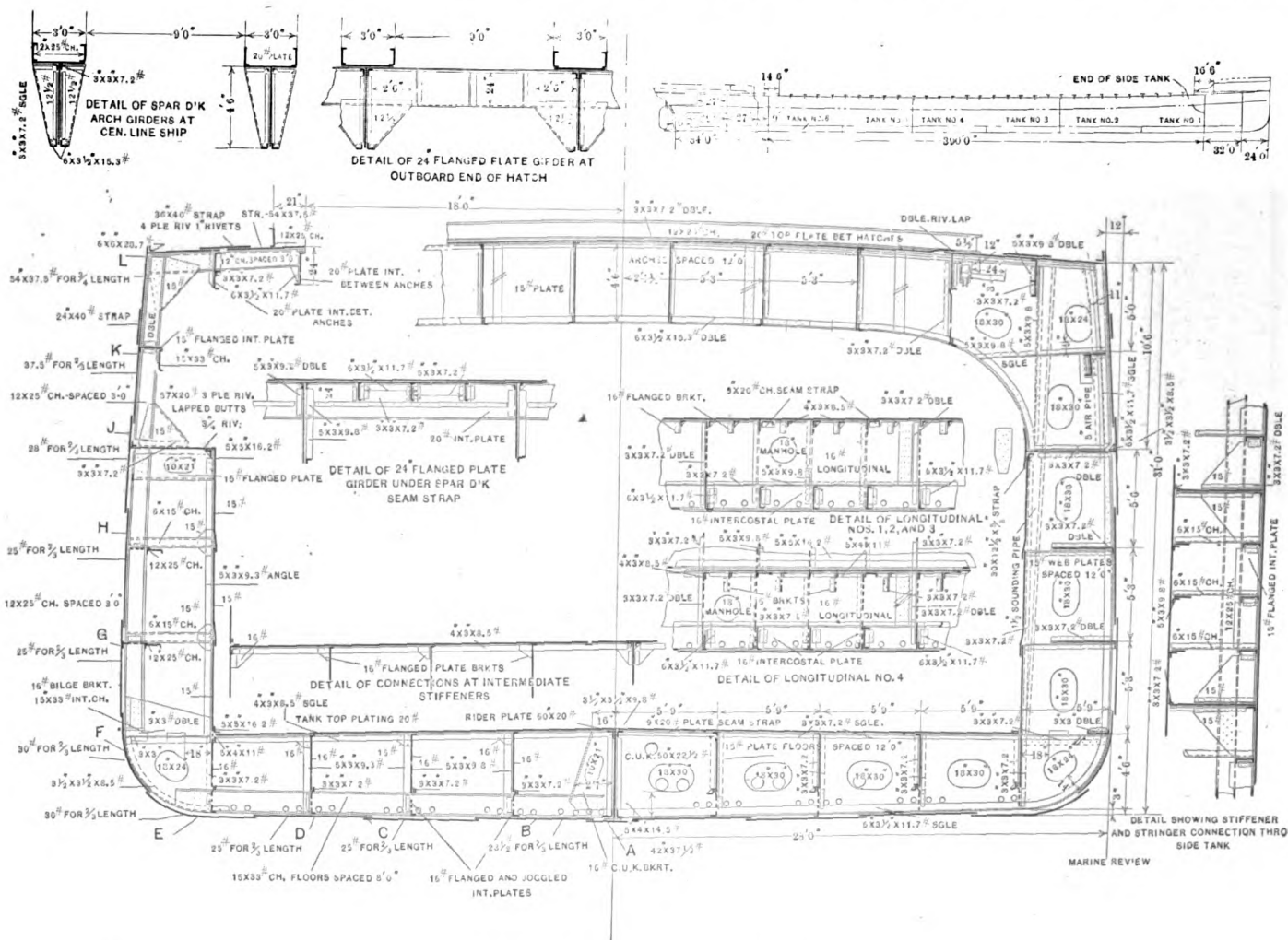
with independent lockers. It is noted that the rooms of the wheelmen and watchmen also have independent lockers for each member, insuring privacy of personal effects. In these two rooms is also noted a departure, which, while small, bespeaks much thoughtfulness. The watchmen have need of heavy boots and a special locker is provided in which to store them. The corridor leading to the windlass room forward of the crew's quarters is of sufficient width to permit the taking

main deck stringer underneath. This staging is easily removed, and the arrangement is certainly an easy one for getting supplies aboard.

The captain's quarters consist of office and bedroom with bathroom intervening, the prevailing decorations being green and gold. A chart-case and desk are built into the woodwork as are also the water racks and dresser. There is telephonic communication direct with the engine-room and as stated, a stairway leads directly to the pi-

impact of the ships themselves. Anchor buoys are also provided so that in case it becomes necessary to let go an anchor its general location can be defined by the buoy.

Much thought has been bestowed upon the arrangement of the deck-house aft with special reference to the quarters for deckhands and firemen. In the old style vessel it was customary to house the deckhands and firemen in an independent deck-house located practically amidships, but in the



MIDSHIP SECTION OF THE STEAMER J. H. SHEADLE.

out of the windlass should it be necessary to repair a part of it.

The dunnage room on the main deck forward is very complete in its arrangement, as reference to the detail plan will show. There is a place for everything in this room and all supplies are instantly accessible, an important point for the crew to consider. No detail seems to have been too small to escape notice, for there is even provided a rack for the sounding rod. A supply davit is installed over No. 1 hatch for the purpose of lowering supplies upon a temporary staging in line with the

lot-house above. Steam and hand steering gear are both installed in the pilot house. It is observed that the forecastle desk is carried about 3 ft. aft of the texas, making a sheltered bridge for passengers.

The anchors of this steamer are self-stowing, leaving nothing outside the hull except the flange or base of the flukes, closing the opening in the hawse pipe and leaving the outside of the hull practically without a dangerous obstruction. This is a manifest advantage, for frequently in collisions the projecting flukes of the anchor do more damage than is done by the mere

development of the unloading machines it became necessary to have the deck free from all obstructions from forecastle to engine room to secure maximum efficiency in unloading. The deck-house amidships, therefore, had to go and in nearly all the vessels built on the arch girder system, with hatches spaced 12 ft. centers, provision has been made for housing deck-hands and firemen on the main deck aft of the engine room. In the Sheadle the quarters for deck-hands and firemen are on the spar deck directly over the boilers. The primary impression would be that these rooms

HEATING SURFACE	{ TUBES -----	2275
	{ FURNACES -----	131
	{ CONB. CHAMBERS -----	259
	TOTAL	2663
GRATE SURFACE 5' 3" BAYS		57.75
DRAFT THRO' BOILER TUBES		16.28
RATIO: <u>HEAT NO SURFACE</u>		45.2
	GRATE SURFACE	
RATIO: <u>GRATE SURFACE</u>		
	DRAFT AREA	3.78

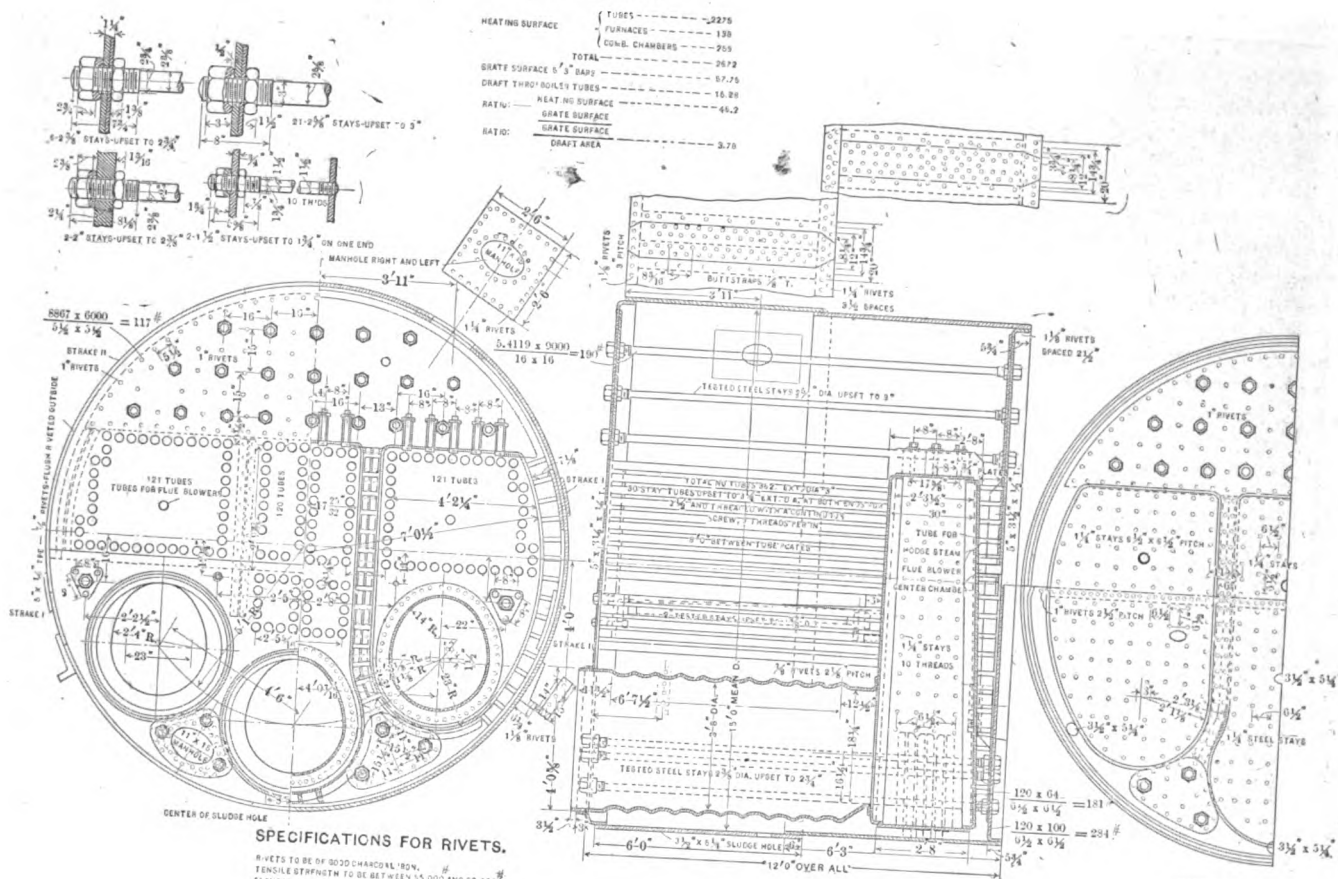
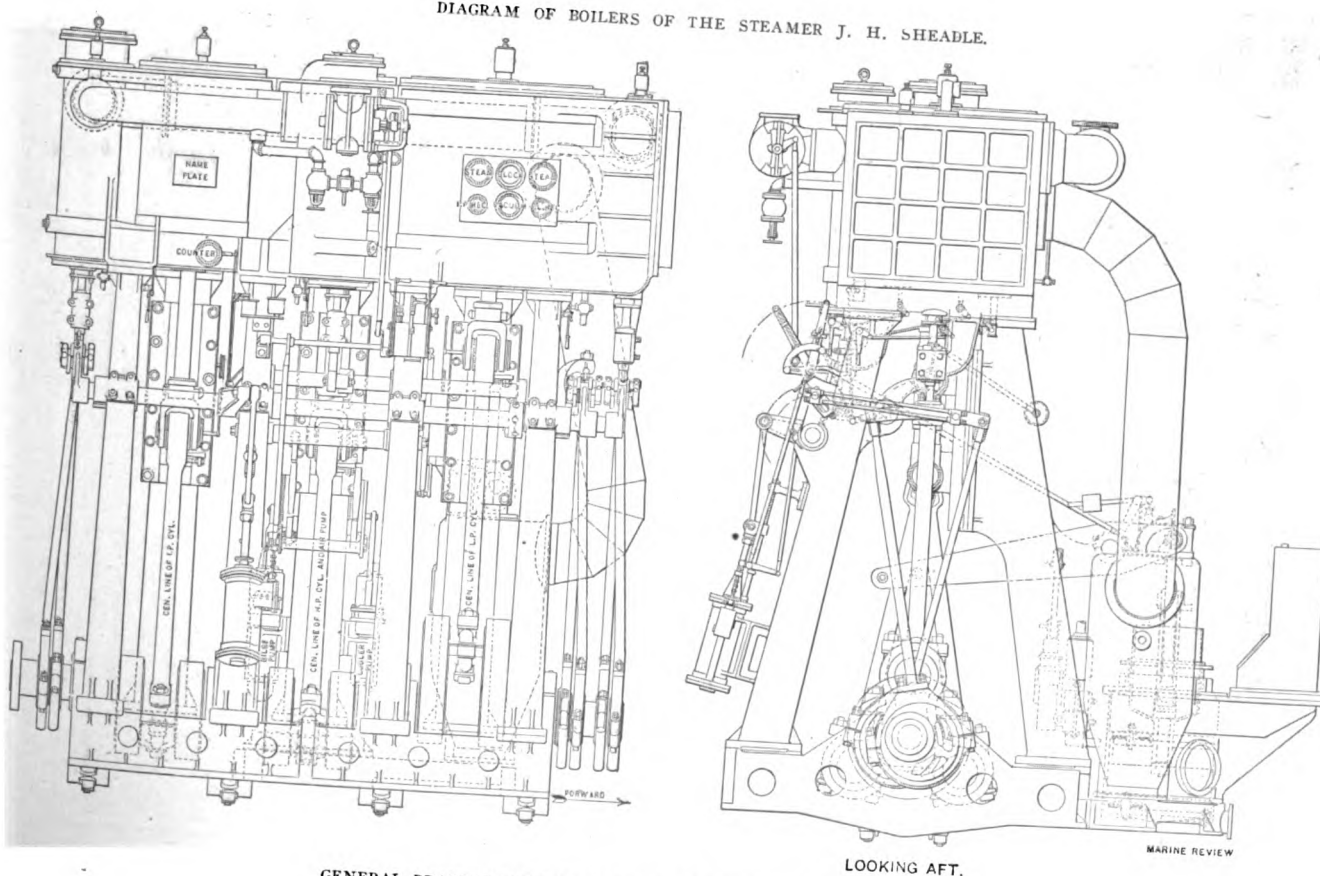
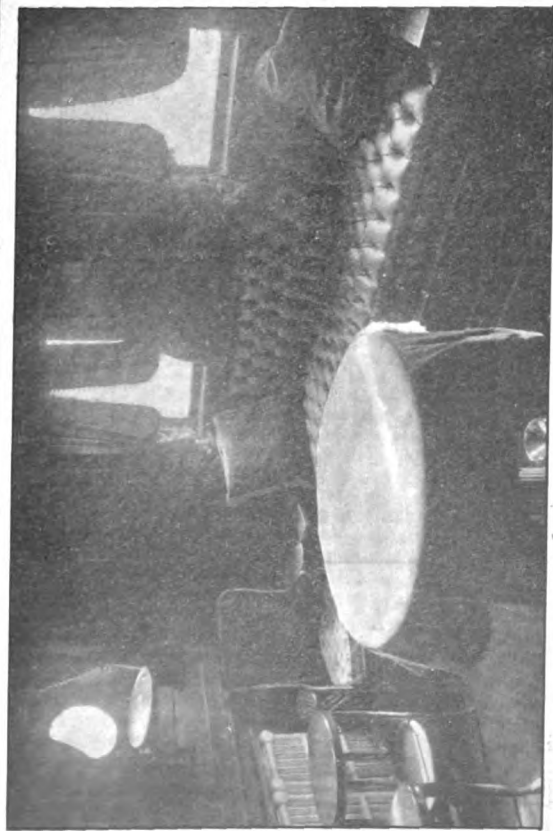


DIAGRAM OF BOILERS OF THE STEAMER J. H. SHEADLE.

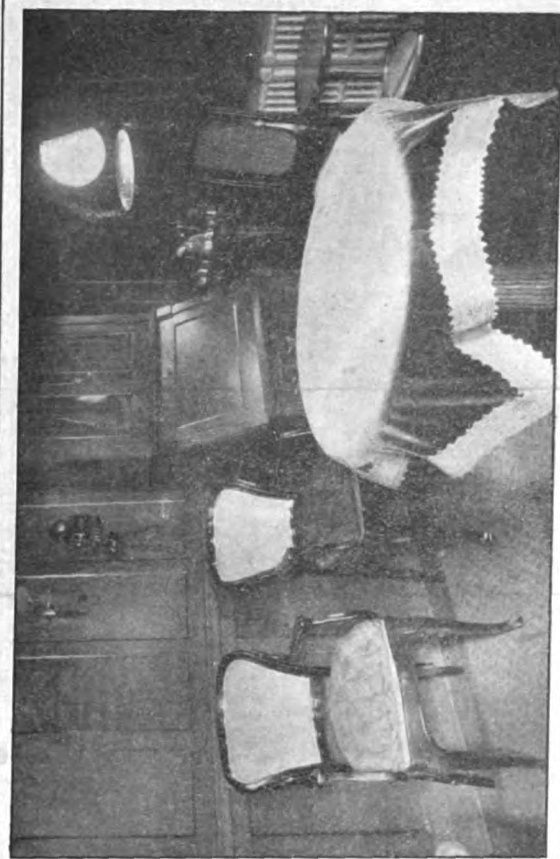


GENERAL DRAWING OF ENGINES OF THE STEAMER J. H. SHEADLE.

PASSENGER QUARTERS, STEAMER J. H. SHEADLE



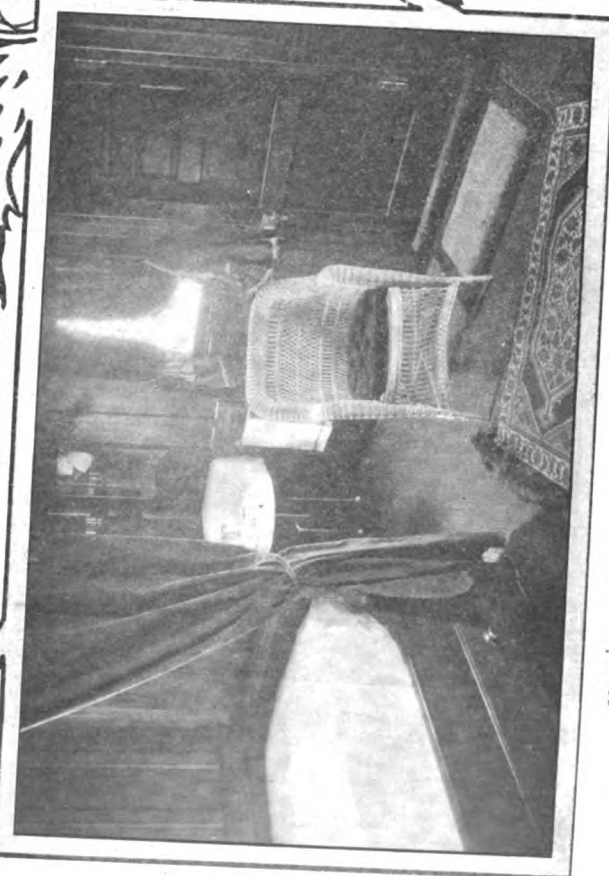
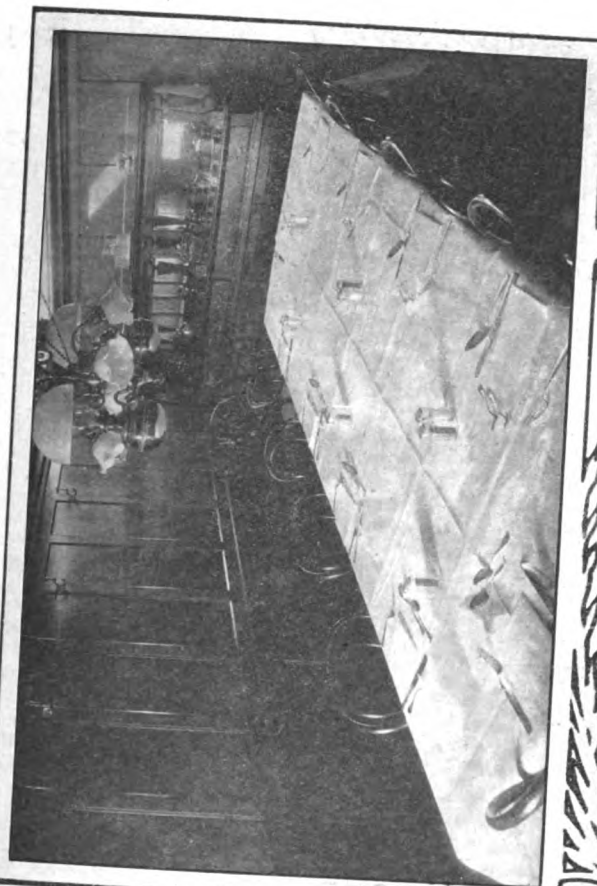
PARLOR, PASSENGER QUARTERS, LOOKING AFT, STEAMER J. H. SHEADLE.
PRIVATE DINING ROOM, STEAMER J. H. SHEADLE



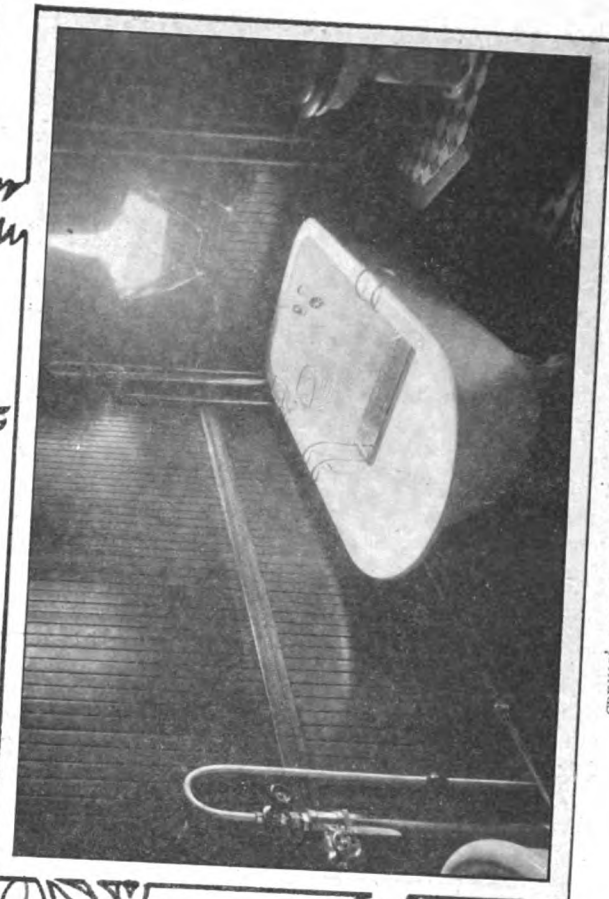
PARLOR, PASSENGER QUARTERS, LOOKING FORWARD, STEAMER J. H. SHEADLE.
STATE ROOM, PASSENGER QUARTERS, STEAMER J. H. SHEADLE.

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OFFICERS' QUARTERS, STEAMER J. H. SHEADLE



MATE'S STATEROOM, STEAMER J. H. SHEADLE.
CAPTAIN'S STATEROOM, STEAMER J. H. SHEADLE.



CREWS' DINING ROOM, STEAMER J. H. SHEADLE
CAPTAIN'S BATH ROOM, STEAMER J. H. SHEADLE

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for locking same. Suction ends of ballast pipes are led close to center keelson on each side and brass plugs are fitted in all drain and ballast piping at after end. Bilge piping, sounding and air pipes, fire pump and piping, water line and deck pumps and syphons are of the latest and up-to-date.

The joiner work is up-to-date and all the quarters are comfortable with every convenience like a first class hotel, the plumbing, ventilating and heating being of the very latest designs. A full and complete installation of incandescent electric lights are furnished for properly lighting the ship. They consist of two 10 K. W. direct connected marine type generating sets of about 180 16 C. P. capacity each. Separate circuits for different parts of the ship. Electric masthead, range and side lights. Deck is lighted by ten single 24 C. P. portables on separate circuit, with necessary poles for carrying same, arranged to go on either rail with suitable sockets. Hold is lighted by two 24 C. P. lights at each hatch. All fixtures below decks are of marine type, fitted with steam tight globes.

Switches are provided in proper places for lighting and every part of the ship is perfectly lighted. Electric bells, telegraphs, signals, etc., of up-to-date make are installed.

MACHINERY OF THE SHEADLE.

The machinery of the Sheadle is designed to drive her at an average

the worst weather is to be expected. She carried during the test 9,400 gross tons on 18 ft. 5½ in. draught at 11.63

expansion type. The high pressure cylinder is 23 in.; the intermediate 37 in. and the low pressure cylinder 63

TRIAL OF S. S. "J. H. SHEADLE."

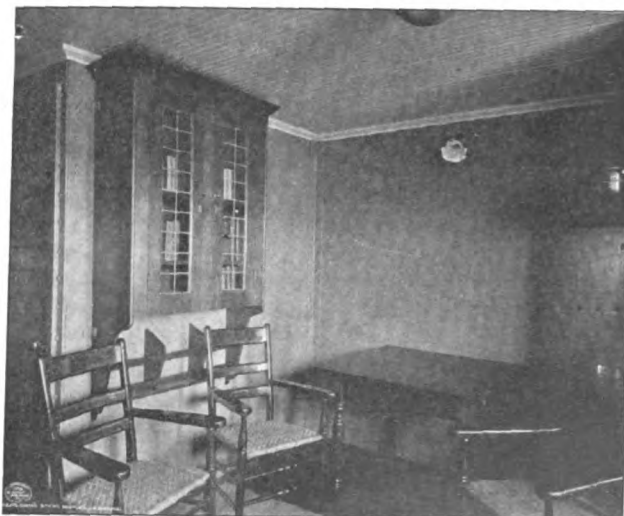
By MESSRS. HYND and COUGHLAN.
BET. DETOUR and FORT GRATIOT.

LAKE HURON
NOV. 15, 1906.

Hull.....	550 ft. overall, 530 ft. keel, 56 ft. beam, 31 ft. depth.
Draught.....	18 ft. 1" ford, 18 ft. 10" aft.
Load.....	10528 net tons, 9400 gross tons.
Engine.....	Triple expansion 23"-37"-63" x 42". Air pumps 36" dia. 14" stroke, trunk 24" dia. dir. vert. driven.
Boilers.....	2 cylindrical 15 ft. 0" dia. 12 ft. 0" overall Pressures allowed. per 175 lbs. 6" furnaces 44" dia. grate bars 5 ft. 3" long. Total grate surf 115.5 sq. ft. heating surf 5344 total heating surf = 5344 grate surf 115.5 = 462
Displacement.....	14900 net tons 13303 gross tons
POSITIVE HEATED DRAFT	
Blower.....	A. B. Co. fan 78" dia. wheel 34" dia. suet. 32½x32½ disc.
Blower engine.....	7"x7" vertical direct connected
Heater.....	25" o. d. 7 ft. 6" tubes 226 sq. ft. heating surface
Propeller.....	14 ft. 3" dia. { 13 ft 0" at hub { pitch dev. area 79 sq. ft.

DURATION OF TEST. (1:45 P. M. to 7:45 P. M.)=6 hrs.
Indicator Cards Taken Every 60 min.

Boiler pressure.....	171 lbs.	Draft at fan.....	1¾"
I. P. Rec. ".....	61 lbs.	Draft at ash pit.....	¾"
L. P. Rec. ".....	10.27 lbs.	Coal (Good).....	19360 lbs.
Vacuum.....	21.9	Coal Total 6 hrs. 50 min.....	2700
Rev. Per Min. (Average).....	83.77	Ash " 6 ".....	14%
Piston speed.....	586.4	Coal per hour.....	2835 lbs.
M. E. P. H. P. Cyl.....	77.3 lbs.	" " " per I. H. P.....	1.54
" - I. P. ".....	32.5 lbs.	" " " 50 ft. grate.....	24.54
" - L. P. ".....	11.6 lbs.	Combustible Total.....	16660 lbs.
Ref. M. E. P. Tol. L. P.....	33.19	" per hour.....	2439
I. H. P. - H. P. Cyl.....	570.7	" per H. P.....	1.32 lbs.
" - I. P. ".....	620.8	Speed of ship. mi. per hr.....	11.63
" - L. P. ".....	642.5	Between Detour Chan. Light and Thunder Bay-74 miles. Time 6 hrs. 22 min.	
" Total.....	1834	Slip.....	12.9%
I. H. P. 1834 = 15.8		Weather Fair.	
Grate Surf. 115.5		No Wind.	
Heating Surf. 5344 = 2.9		D ² x S ² = 316	
I. H. P. 1834		C = I. H. P.	
Temp. Inj. water.....	50°	I. H. P. x 33000	51648
" of hotwell.....	140°	P x R	
" feed heater.....	177°	oz Coal per net tons per cargo mi.....	.37
" air at ash pit.....	270°		



CREW'S SITTING ROOM, FORWARD, STEAMER J. H. SHEADLE.
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CARGO HOLD, STEAMER J. H. SHEADLE.
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speed of 11 miles an hour with a load of 10,000 tons on 19 ft. draught. The data of her trial trip on Nov. 15, tabulated herewith, shows that she has done even better. Her trial was undertaken under ordinary service conditions and at a time of the year when

was developed for 29 sq. ft. of heating surface and 15.8 H. P. for each foot of grate surface. The result of 1.54 lbs. of coal per horse power per hour is quite satisfactory both to owners and builders.

The engine is of the inverted, triple-

in, diameters with a common stroke of 42 in. The low pressure cylinder is placed forward, the high pressure in

the middle and the intermediate aft, an arrangement found to be the most satisfactory both as regards minimum space, as well as symmetry and simplicity. This is a practice followed on lake steamers, generally since its introduction on the steamer Manchester

by the old Hodge plant fifteen years ago.

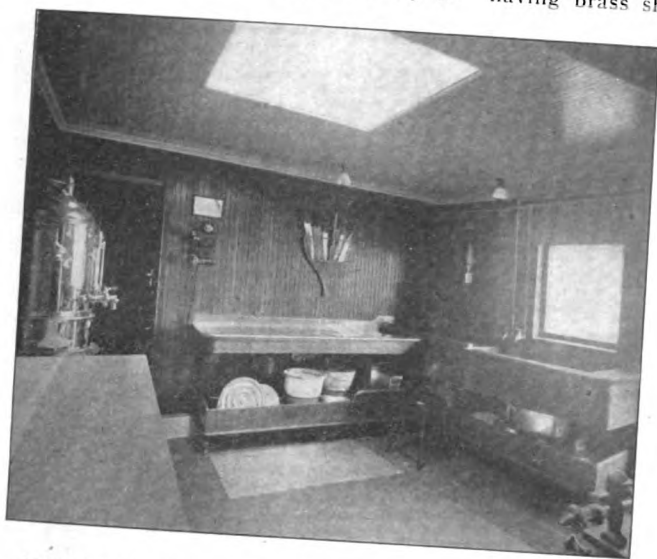
The high and intermediate cylinders are fitted with piston valves and the low pressure cylinder with a triple ported slide valve. All three cylin-

ing, 12 in., 6 in and 12 in. There is one sanitary pump, 6 in., 4 in. and 6 in., placed in the lower engine room.

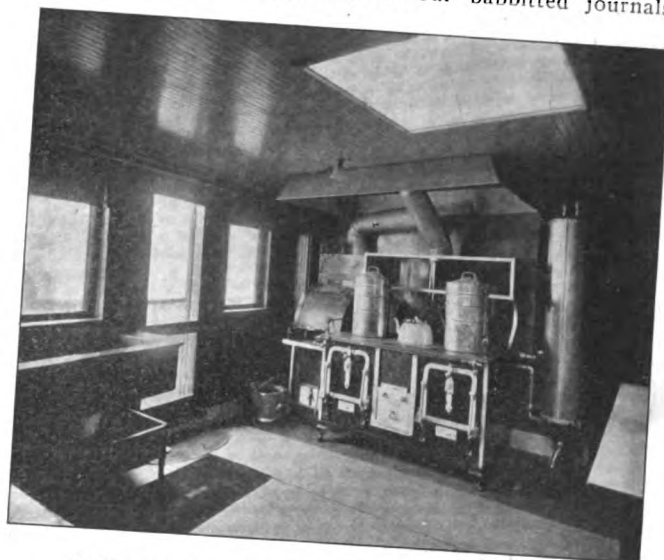
The piston rods are $5\frac{1}{4}$ in. diameter, fitted into annealed steel crossheads having brass shoes, both for go-ahead

on top and babbitted cast steel boxes at the lower end.

The crank shaft is of the built-up type with cast steel arms shrunk on. The crank shaft is 12 in. in diameter supported in four babbitted journals,



GALLEY OF STEAMER J. H. SHEADLE, LOOKING FORWARD.



GALLEY OF STEAMER J. H. SHEADLE, LOOKING AFT.

ders have deep pistons and it is worthy of note that neither the piston valves nor the high pressure nor the intermediate pressure pistons have any packing rings, only deep removable followers, and as a matter of fact, no indications of wear have taken place during several seasons, as observed on former engines. Narrow packing rings of the Kendall type are fitted on the low-pressure pistons. All valves are operated with Stephenson link motion and with a simple rocker arm for the high-pressure valve.

Metallic packing of the Garlock make is fitted on all valve stems and piston rods.

The air pump is worked from the high-pressure cylinder cross-head and is 36 in. in diameter by 14 in. stroke, fitted with a trunk 24 in. in diameter. All valves have ample area and are very accessible for quick overhauling.

The bilge pump is 6 in. by 12 in. and the cooler pump is 4 in. by 12 in., both driven from the air pump beam. The feed pump is of the independent, simplex, horizontal, double acting, pot valve type, 12 in. - $7\frac{1}{2}$ in. and 16 in.

The fire pump is of the usual underwriters' type, built by Fairbanks, Morse & Co., horizontal, duplex, double act-

and backing, giving a pressure per square inch of 40 lbs. and 100 lbs., respectively.

two $16\frac{1}{2}$ in. and two 20 in. long. The crank pins are 12 in. and 12 in.

The thrust bearing is braced to the bed plate and has six driving collars giving a pressure per square inch of 40 lbs., average working pressure.

The outboard shaft is 12 in. in diameter enlarged in the stern bearing to $12\frac{3}{4}$ in. The bearing is 4 ft. long, lined with lignum vitae.

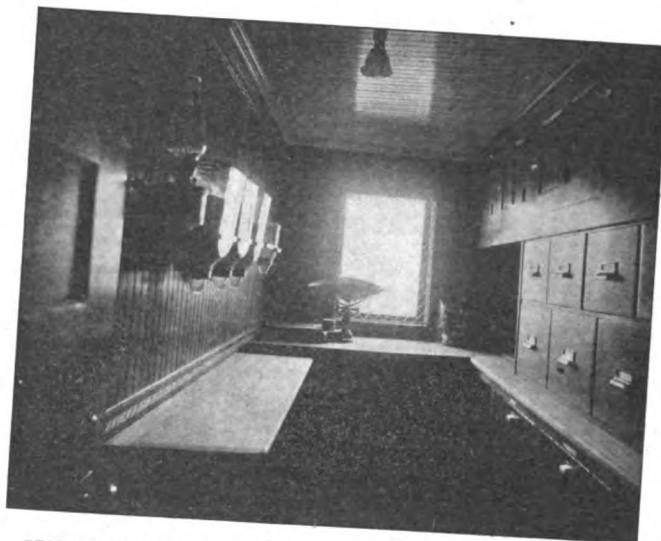
The propeller is of the sectional type, 14 ft. 3 in. in diameter and with a circumferential pitch of 14 ft. 3 in., at the boss 13 ft. and a developed area of 79 sq. ft.

There are two boilers, 15 ft. in diameter by 11 ft. 6 in. long over-heads with a working pressure of 175 lbs. Each boiler has three

44 in. Morison corrugated furnaces; 362 3 in. tubes (external diameter); 8 ft. between tube plates. Total heating surface of the two boilers is 5,344 sq. ft. The grate surface is $115\frac{1}{2}$ sq. ft., giving a ratio of heating surface to grate surface of 46.2.

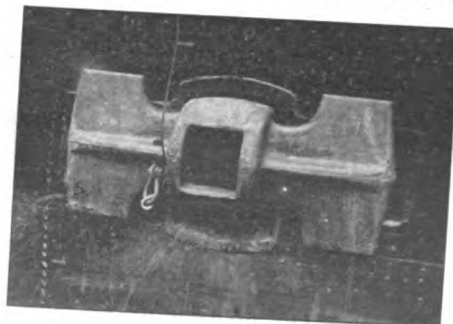
These boilers are worked under the improved Great Lakes Engineering Works system of forced, heated draft, giving not only exceedingly good economical results, but also a comfortable and cool fire hold.

The fan supplying the necessary air for combustion has a fan wheel 78 in.



STOREROOM FORWARD OF GALLEY, STEAMER J. H. SHEADLE.

The connecting rods are 8 ft. 6 in. long between centers, with brass box



SELF-STOWING ANCHORS, STEAMER J. H. SHEADLE.

in diameter and an outlet of 32½ in. This wheel is driven direct from a 7 in. x 7 in. vertical, self-oiling, engine of approved make. The whole apparatus is placed on the main deck

of the vessel is the enormous water ballast capacity and the owners required it to be emptied in five hours. For this purpose there are three different ballast pumps; one No. 12 centrifugal pump, 12 in. x 10 in. steam cylinder having a 14 in. suction pipe and a 12 in. discharge. In addition to this pump, and as an assistance, there are two 12 in., 16 in. x 18 in. duplex, vertical pumps, all located in the lower engine room, conveniently connected to the ballast header.

The steam steering gear is of the all round Hyde make and placed forward.

To handle the mooring cables four Chase engines are installed, two forward and two aft. The windlass is of the Hyde pump-brake type, handling 2¼ stud-link cables with anchors of 8,000 lbs. weight each. One Hyde reversible capstan is installed on the after deck for handling line over stern and is also rigged with gear for steering by the spare tiller.

ELECTRIC EQUIPMENT OF THE SHEADLE

A double system of electric signals is installed throughout, there being both wire pulls and electric service between the pilot-house and engine-room, as well as on the bridges. As indicated, the telephone service consists of two lines, one from the pilot-house to the engine-room and one from the parlor to the galley. The vertical lever whistle pull supercedes the old crank system, there being a direct chain and cable with no triangle. The Ray system of telegraph from

bridge to engine-room is used. A tell-tale is also installed to indicate to the wheelsman on watch if anything happens to the running lights. The elec-



CAPT. J. M. JOHNSTON, MASTER.

near the engineer's handling gear so that it is accessible at any moment. The suction air duct is extended past the boilers and into the fire room so as to pick up any noxious gases and dust, etc.

One of the most interesting parts



THOMAS DURKIN, CHIEF ENGINEER.

trical fixtures in the passenger quarters are in Colonial design, harmonizing finely with the woodwork.

Capt. J. M. Johnston, her master, and Thomas Durkin, her chief engineer, brought the Sheadle out.

EKERT HIGH RESISTANCE MATERIALS.

Fred M. Ekert, inventor of the Ekert high resistance materials, was born in Germany, May 11, 1859. He has made chemistry and physiology his life's study. In the year 1891 he began his experiments in connection with higher pressure steam after the principles discovered by Prof. Duapree in his endeavors to produce minerals artificially. Nature produces minerals by heat and also by steam and other gases as the often-met enclosures of water in the crystals of quartz, amethyst, and other semi-precious stones prove. Duapree's results were got with very small tubes, partially filled with water and submitted to direct heat for several hours. The tubes were entirely closed and often times terrible explosions occurred owing to Duapree's failure to allow sufficient space for expansion. Ekert began his experiments in a six by two-foot boiler, connected by two-inch pipes with a tank and pressure was used up to 750 lbs. per square inch. Wood laid

in the tank got a brownish color and became as soft as snow, so that balls could be formed of it like snow balls, except that they became hard again as soon as they dried out. Tin melted at 460 lbs. In his experiments Mr. Ekert could not find anything in the line of packing which would stand over 100 to 120 lbs. pressure, and therefore endeavored to invent something himself. He has made a packing out of asbestos using graphite ore iron oxide as a pore filler. He has evolved from these materials a new packing which withstands all the requirements of modern steam and for which he has been granted three patents in the last year. The packing is elastic and indestructible. A company is now being formed to manufacture exclusively the Ekert high resistance materials to which attention will be paid later.

DANIEL MAHONEY & SONS.

Daniel Mahoney & Sons, Buffalo, N. Y., are building up an extensive marine trade. The McBean wrought steel ranges which this firm manufactures

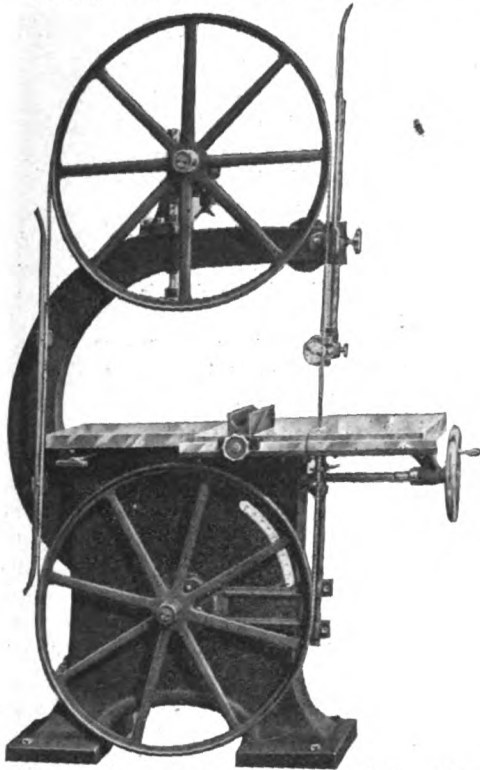
have been installed on about sixty of the new steamers built on the lakes during the past two years. The firm is also the maker of signal, anchor, binnacle, triangle and square lamps, which are meeting with much success. They have just put out a couple of very fine catalogues which may be had by anyone interested for asking.

At the annual meeting of the Cleveland Lodge of the Ship Masters' Association, the following officers were elected: President, H. A. Byrns; first vice president, Capt. Lafayette Stough; second vice president, Capt. Robert Thompson; treasurer, Capt. F. L. Lechie; secretary, Capt. Carlton Graves. Capt. H. A. Byrns was elected delegate and Capt. H. T. Kelly alternate to the Grand Lodge meeting, which will be held at Toledo the latter part of January.

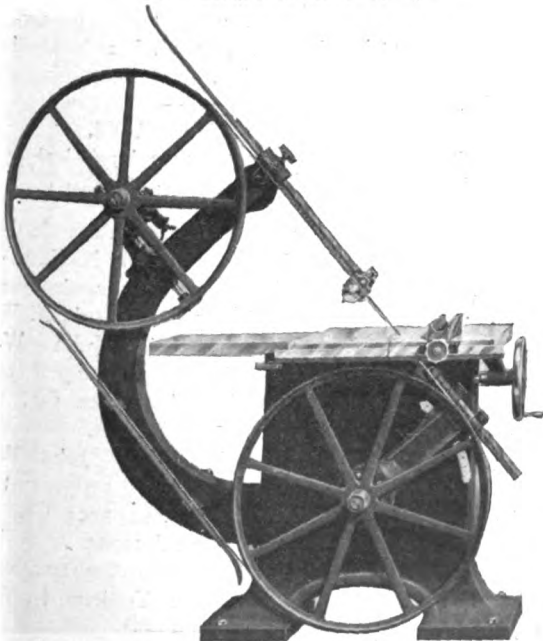
The Canadian Ship Building Co. has purchased 476 acres of land adjoining its Bridgeburg plant giving it possession of a tract of 600 acres.

THE CRESCENT ANGLE BAND SAW.

The most economical method of doing bevel sawing in connection with ship building operations is with the band saw



machine. The machine best adapted to this kind of work is one on which the angle of the saw can be changed, and on which the table is always level. The advantage of always having a level table on a band saw machine is at once ap-



parent to those familiar with this class of work. The operator is not put to the disadvantage of having to handle a heavy stick of timber on a slanting table, but always has a perfectly level table to work on. Up to the present time this class of machine have been complicated in construction and rather expensive to

install, but the accompanying illustration shows a very simply constructed band saw on which the table is always level. The machine is manufactured by The Crescent Machine Co., Leetonia, Ohio, who built the saw tables, jointers and also a line of tilting table band saw machines.

One of the principal features embodied in this machine is that all the parts act automatically. No special adjustment is necessary in changing the angle of the saw, and the entire operation is accomplished by turning the hand wheel at the side of the table until the pointer indicates the required angle on a graduated quadrant attached to pedestal. This may be done while the saw is in motion, making it a very easy matter to cut different bevels on the same piece of work. The hand wheel turns easily, as the weight of the upper part of the machine is counterbalanced. The driving pulley is located in the usual place, and this machine is as easily belted up as an ordinary band saw. When the saw is tilted the table is carried back on the pedestal in proper relation with it, so that the saw keeps its proper position in the saw slot. Exact alignment is maintained of the upper and lower guides with

the saw, and the lower guide is always held at the proper distance from the under side of the table. The tension of the saw is not changed when the angle is changed. There is no complicated mechanism in the construction of the machine, and owing to the simplicity it is less expensive to build than other machines of its class.

The arm is hinged to the pedestal in a rigid manner by a heavy trunnion passing through both, concentric with the lower shaft, making the machine as rigid when tilted as when standing erect. The bearings for the lower shaft consist of solid bushings fastened into the trunnion, and are provided with oil chambers and capillary felt, making them practically self-oiling and dust proof. The upper bearing is made with the revolving shaft running in adjustable bearings, as on the company's regular band

saw. The table slides on planed ways on the pedestal and has a steel gib for taking up wear. The saw will tilt to an angle of 45 degrees, a stop being provided at that point, and may also be tilted forward to 4 degrees beyond the perpendicular. A stop is also provided for the perpendicular position, so that

this setting may be easily accomplished without referring to the graduated quadrant. This stop can be instantly swung out of place to allow the saw to pass on to an out tilt angle.

The machine, in common with the company's regular line of band saws, is provided with the following features: Spring tension, counterbalanced guide bar, hollow cored-out frame, universal adjustment to upper wheel, etc.

Catalog giving complete information of this machine and describing the other machines manufactured by this company will be mailed on request.

THE S-M WATER-TIGHT BUNCH LIGHT.

The S-M Bunch Light (patent applied for) manufactured by the Seidler-Miner Electric Co., Detroit, Mich., was especially designed to meet the



THE S-M WATER-TIGHT BUNCH LIGHT.

requirements of a more perfect protection for incandescent electric lamps used in clusters wherever subjected to hard usage, water; and in places containing explosive gases. It is the only portable fixture fitted with a number of lamps each enclosed in an outer globe, and the whole cluster protected within one guard. Constructed upon practical ideas, extreme care and judgment has been exercised to make it a most substantial and simple outfit. Unincumbered by any adjustable or

loose parts, its enduring qualities are not impaired by usage. The openings at each end permits the removal or replacing of globes with the greatest ease and rapidity. All impact comes upon the guard, which fully protects the fixture and which is made of sufficient strength to prevent any distortion when subjected to most severe usage. It can be dragged along decks, or rolled about without harm. It can be carried to any location, and its cable plugged in circuit. It is just the thing for lowering into holds of ships; dropping over the sides, hung to riggings, poles, or stanchions, located where illumination is desired.

It gives a large volume of light, but unlike the arc lamp, it is not affected by vibration or jars. No carbons to be constantly replaced or adjustments required to mechanism; no expert attention as it is simple in all of its details.

It is fitted with V. P. globes and incandescent lamps that are standard therefore renewals can be procured at most any port or regular electrical supply dealers of any city. Compare this with a large and special glass-ware, if a cluster of lamps were inclosed under one globe, or of the different makes of arc lamp globes.

It is safe, as each lamp is inclosed within a V. P. globe as required by the board of underwriters where light is used in places subject to gases or combustible materials. One lamp giving out does not affect the others as each lamp is a unit.

It is made in an oval shape 12 in. round and 18 in. long and is not only compact but by its rounded ends is not subject to catching anything when being dragged, raised, or lowered.

The S-M Water-tight Bunch Light is especially adapted for ships, mines, tunnels, railways, and for other work where lamps require protection, but as a practical deck and cargo cluster, it has no equal.

It is ideal from an economical standpoint and the price small when compared with the protection it affords the lamps and the safe-guarding of valuable interests.

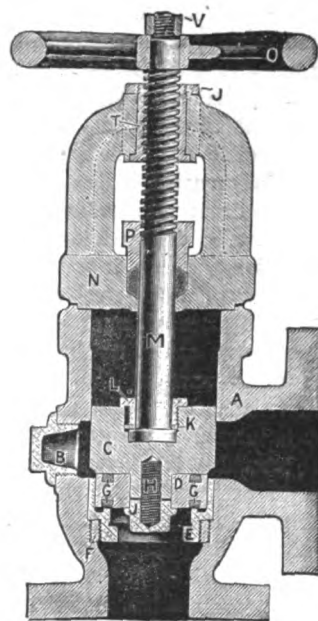
The Seidler-Miner Electric Co. also manufacture a full line of standard marine electrical fixtures and fittings, on which they issue a complete catalog, which can be had upon application.

Angus McKay, who acted as wheelman on the steamer Kensington the past season, will make a tour of Canada as the MARINE REVIEW'S special representative. Mr. McKay has many friends on the lakes.

AN IMPROVED BLOW-OFF VALVE.

The cut herewith fully illustrates an improved design of blow-off valve which embodies a number of important features highly appreciated by users.

Heretofore, in all makes of blow-off valves, the seat was so located, that, as the disc approached same, there would



DURO BLOW-OFF VALVE.

be an accumulation of scale and sediment. The effect of this accumulation would be to cut out the bearing surfaces to such an extent, that in a short time the valve would become leaky. Various methods have been invented whereby the disc would fit tightly in the valve body, the object being to prevent the scale from passing on to the seat bearing after the disc had passed and cut off the inlet. This method, however, has not proven satisfactory, as the valve body would soon wear, and, in a short time permit the passage of scale and sediment. These defects have been overcome in this improved design blow-off valve. The plug fits snugly in a separate and easily removable bronze casing, which can be readily replaced when worn. Any accumulation of scale or sediment that might remain on the seat before the disc is brought in contact with same is washed off by the water which passes around the plug when seating.

In the sectional view it will be seen that the plug C carries a reversible, double-faced disc D, secured to plug C by stud H and nut J. This plug C is guided perfectly in the valve body A. The bronze seat ring E is screwed into a second brass ring F, the object of this being to make it possible to remove E very easily in case same is worn. At the back of the valve is a plug B, the use of which is to permit the introduction of a rod to clean out the blow-off pipe when

desirable. The stem M, which raises and lowers the disc C, is held in place by lock-nut L, which is prevented from unscrewing by non-rotating washer K. The threads of the stem M cooperate within the bronze bushing in the top of the Yoke, which bushing can easily be removed.

It will be seen from this description that all parts of the valve have been so designed that they can be easily renewed when worn or broken. The disc D, having two Babbitt-faced bearings G G, it can be replaced at small cost, or the user of the valve can melt out the old Babbitt and pour in new metal and, after this is faced off, the disc is as good as new.

In operating the "Duro" valve, when it is desirable to close same, the disc is screwed down in the usual manner. As the edge of disc D approaches the cylindrical extension of E, these edges shear and cut off any scale or sediment which might pass. As the disc D continues to approach the seat bearing E, the leakage of water around same will effectually wash off any scale or sediment which might have accumulated thereon. The result of this is, that when the disc is perfectly seated, no scale or sediment can remain between the bearings. As the seat and disc ring can be removed very easily and at small cost, it will be plain that the valve is very durable and will last indefinitely.

This article, known by the trade name "Duro," is constructed of the very best materials and carefully tested, and The Lunkenheimer Co., Cincinnati, who are its manufacturers, guarantee it to surpass in durability, any other blow-off valve on the market.

MARINE PATENTS.

Copies of these patents can be obtained by sending ten cents in stamps to Siggers & Siggers, patent lawyers, suite 11, National Union Ins. building, Washington, D. C.

838,532.—Reversible Propeller. William C. Fischer, Huntington, N. Y., assignor of eighty-five one-hundredths to Maurice Lachman, New York, N. Y.

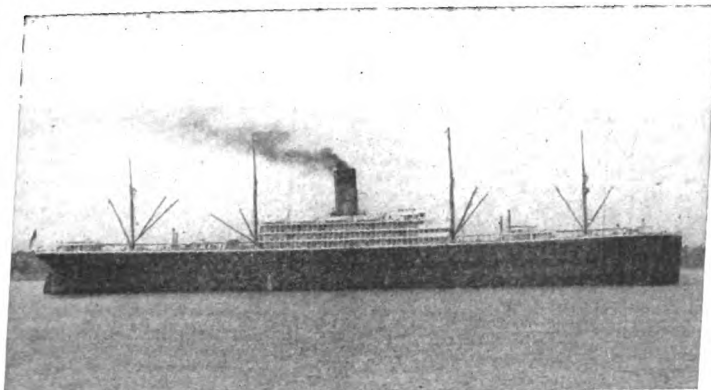
838,690.—Breeches-Buoy, John W. Dalton, Sandwich, Mass., assignor to Dalton Life-Saving Appliance Co., a corporation of Massachusetts.

838,691.—Breeches-Buoy. John W. Dalton, Sandwich, Mass., assignor to Dalton Life Saving Appliance Co., a corporation of Massachusetts.

838,821.—Lighthouse Construction. Thomas K. Thomson, Yonkers, N. Y.

According to plans outlined by John Wharry, mate of the steamer Kensington, he will start a nautical class at Owen Sound, Ont. There are many young Canadian-Americans who are figuring on advancing themselves before navigation opens.

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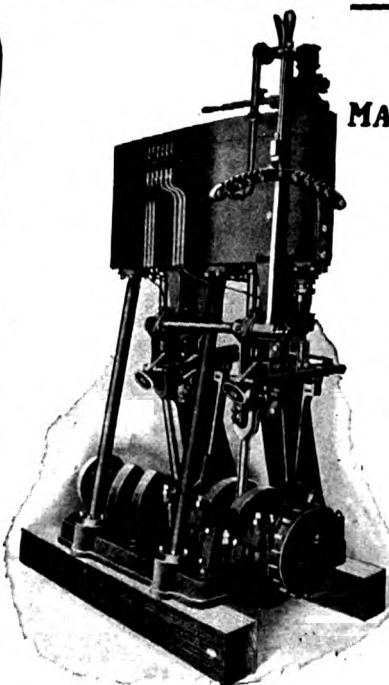


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The dagger (†) indicates that advertisement appears once a month.

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